ENGINEERING NEWS-RECORD

- New bridge spans city's development
- TVA installs largest pump-turbine

Who got the Class of '56? *p. 21*

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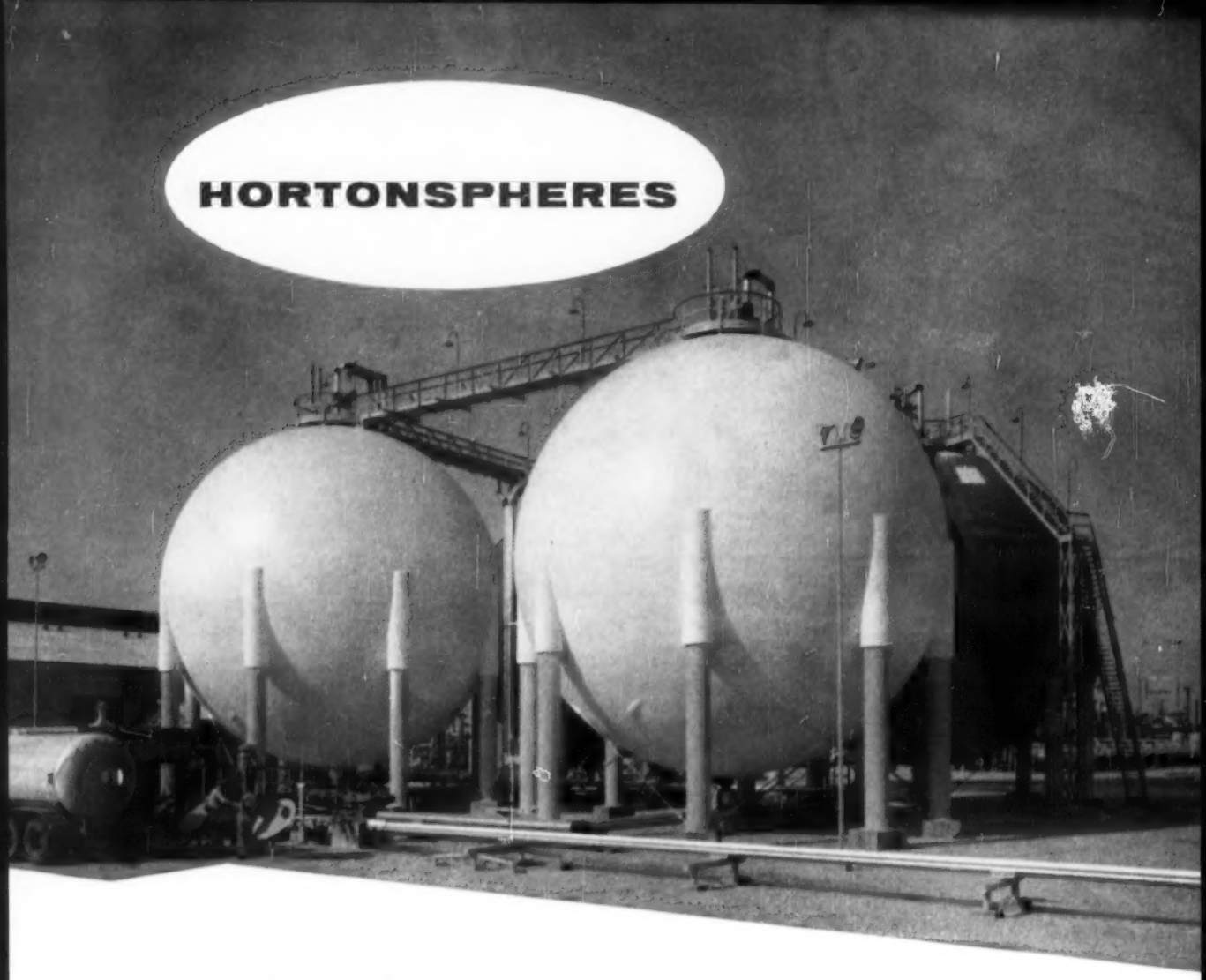

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These Bethlehem bridgemen, working high above the Delaware River, are completing the first panel of roadway steel for the Philadelphia-to-Gloucester, N. J., suspension bridge.

They are shown here placing a truss-type floor beam between two open-webbed stiffening trusses. These mighty trusses run the entire length of the roadway, 3,770 ft between anchorages. Total weight of the roadway steel will be 11,700 tons.

The completed roadway will provide seven traffic lanes. Its clearance of 150 ft above mean high water at the center permits the passage of large vessels.

The $90,000,000 bridge, a project of the Delaware River Port Authority, will have a main span of 2,000 ft tower-to-tower, making it the eighth longest yet built. Engineers: Modjeski & Masters — Ammann & Whitney.

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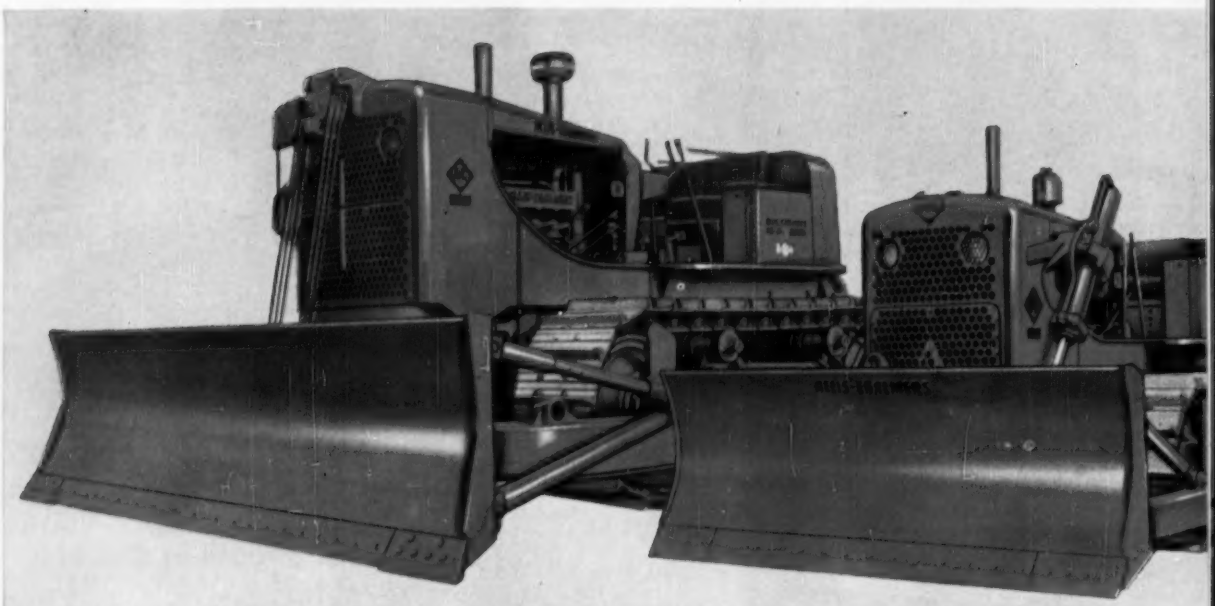

HD-21
204 net engine hp (torque converter drive)
approx. wt (as illustrated) 53,400 lb

HD-11
85 belt hp
approx. wt (as illustrated) 24,600 lb

Advanced basic design makes the difference; look at these specific on-the-job advantages:

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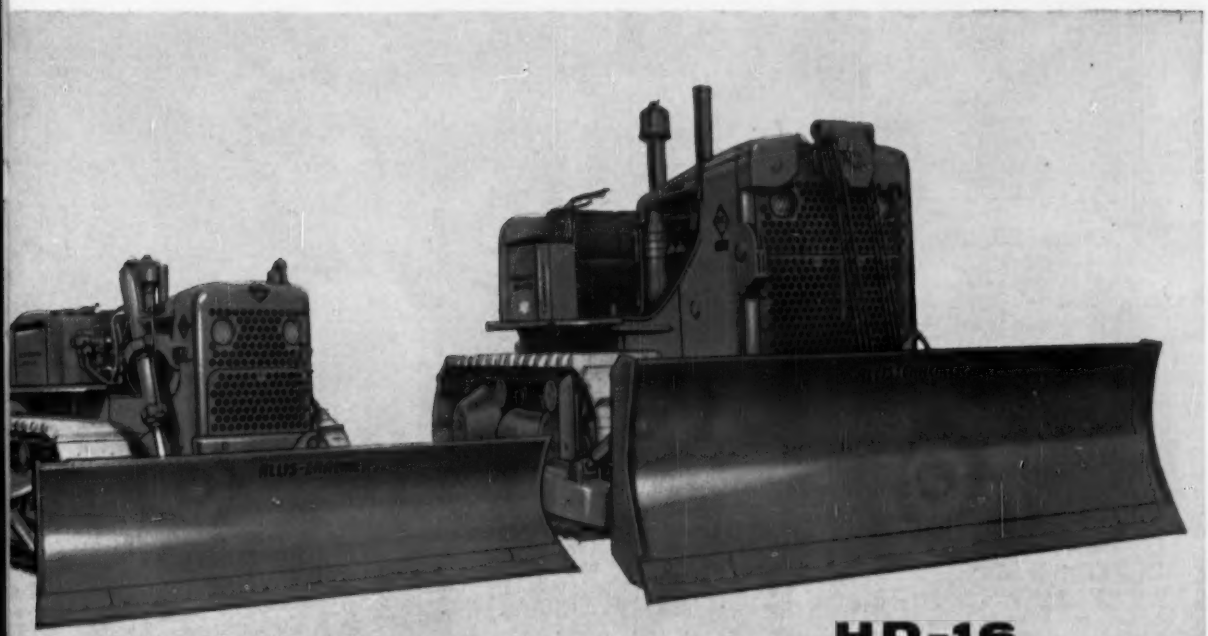
Crawler Tractors give you a more working time – lower costs



HD-6
55 belt hp
approx. wt (as illustrated) 15,850 lb

HD-16
150 net engine hp (torque converter drive)
141 belt hp (standard transmission)
approx. wt (as illustrated) 38,200 lb

mission models) keeps clutches operating longer between adjustments, saves you time and money.

Smooth Torque Converter Drive — (standard on HD-21, optional on HD-16) — Automatically matches speed and power to load and terrain conditions, virtually eliminates shifting, assures steady, high output.

Matchless Servicing Accessibility — Unit construction permits easy servicing in the shop or on the job — quick removal of clutches, transmission, engine without disturbing adjacent assemblies.

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POWERED BY REO'S OWN OH 160 GOLD COMET ENGINE—GAS OR LPG... BACKED BY REO'S OWN 100,000 MILE OR 1-YEAR ENGINE WARRANTY!

The certified chassis weight of Reo's new F-506M is 11,240 lbs. The official weighmaster's receipt proves how it can haul 6½ yds. of concrete and stay well within legal limits. The new Reo F-506M is designed and built specifically for mixer use. Its increased payload is made possible by Reo's new high-strength, low-weight *double-side-rail frame construction.*

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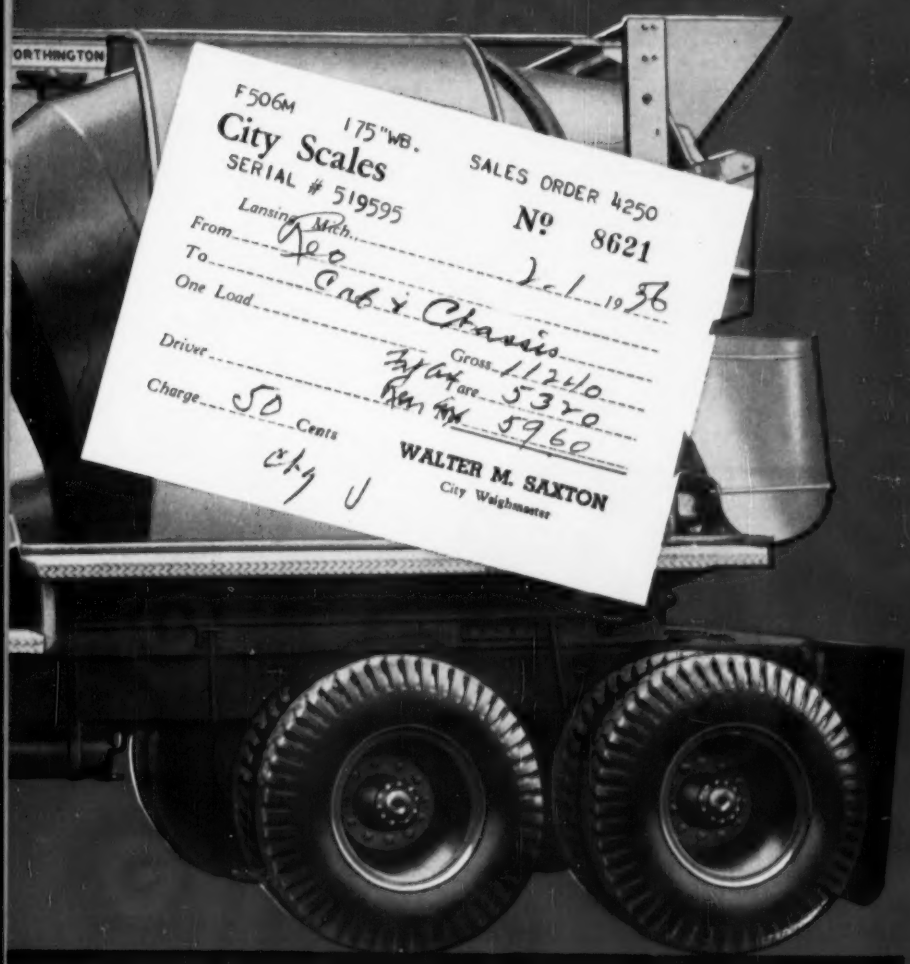

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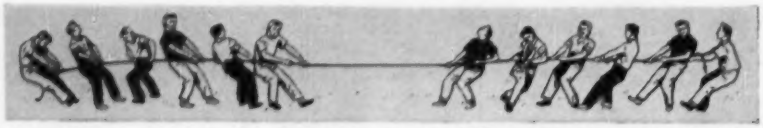

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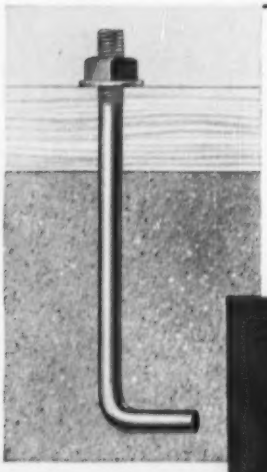

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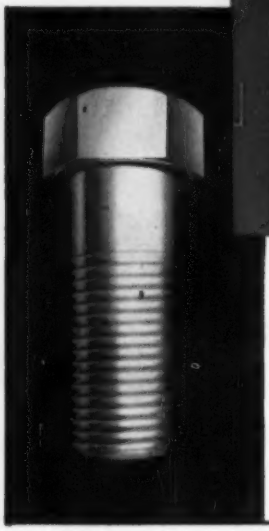

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Reader Comment

Pay Older Engineers More

SIR—May I offer a fervent amen for the letter of Morris Llewellyn Cooke on the shortage of engineers (ENR, May 24, 1956, p. 8). Mr. Cooke is so right!

Most expressions of concern over the shortage deals with the young men and their beginnings in the profession. No one, except President Eisenhower and Secretary of Labor Mitchell, have mentioned the older men of the profession. It does not seem to have dawned on many that the situation of the older men in the engineering profession is one of the deterrents to the recruiting program for the younger men. There was a time when a man was proud to have his son follow him in his choice of a profession, but it does not seem that many of the rank and file of older engineers have any desire to have their sons follow their footsteps today.

It is amazing that the value of experience in engineering has depreciated so much that there are so many engineers with fifteen to twenty years experience whose salaries are even less than the beginning salaries being offered to young graduates today. These men are certainly not forward in promoting their profession to others.

It is tragic for the profession that the age barrier has become so strong within it, and it is tragic for the men themselves. Engineering is a most unstable profession when it comes to permanence of employment. There are many experienced engineers whose mental and moral values have been destroyed by their inability to find work suitable for their experience after they have reached the age of forty.

There are many youngsters who enter the profession on the strength of these terrifically high starting salaries and become disillusioned when they go to work in an organization where there are men approaching fifty whose salary may be less, equal to or, in a few cases a few dollars a month more than theirs. These young men are not so dumb that they cannot realize

Engineering News-Record welcomes expression of opinion from its readers. Comment should be as brief as possible and pertinent to subjects of current construction importance.

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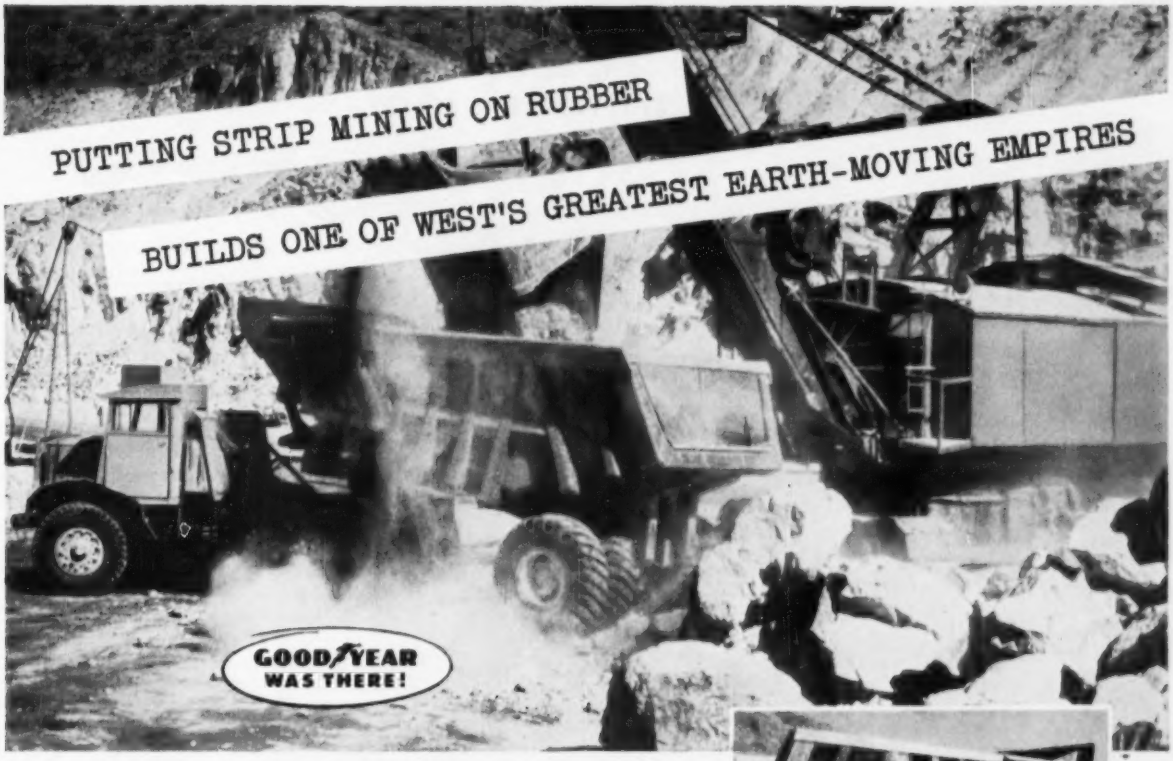

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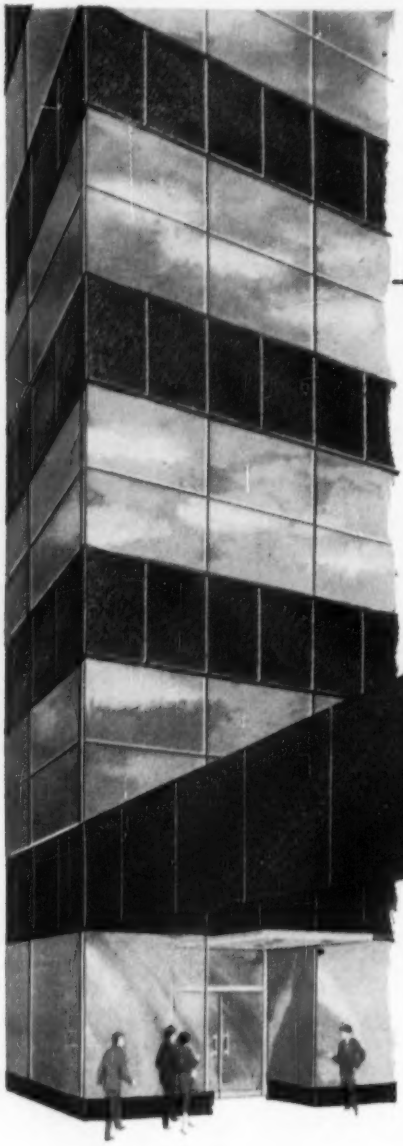

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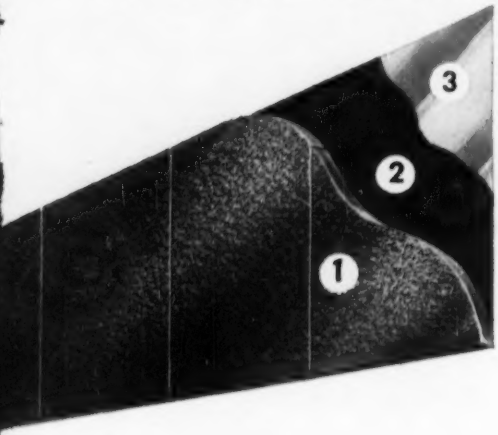

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that the salary scales of the profession are completely out of balance, and they do not enjoy the spectacle of becoming like these older men in the future.

Has anyone considered how much manpower is being lost to the profession by this austere treatment of the older men?

DON V. PURINGTON
Houston, Texas

SIR—After spending some years in the sales of engineering products for construction, a change in management of one of my principal accounts caused me to think about getting back into the design engineering field, which prompted an investigation of what salaries engineers at the design level were getting. I was disturbed, but not too surprised at what I found out.

For recent graduates, the demand has forced the price up pretty well, but it is quite evident that the salaries at the higher echelons are pitiable indeed. It appears that an annual salary of $10,000 a year is a rarity for senior engineers at the design level, and that a great many of them are stuck at the $7,000 to $8,000 level with no hope of advancement.

These are men who accept responsibility for design, who say a beam must be of such and such a weight, the concrete so thick and the pipes of this diameter. They are the broad base of all engineering construction. Yet the carpenter, bricklayer and steelworker, who work seven or eight hours and go home and forget about it, get more than the men who are responsible for the design.

There is something very, very unfair about this.

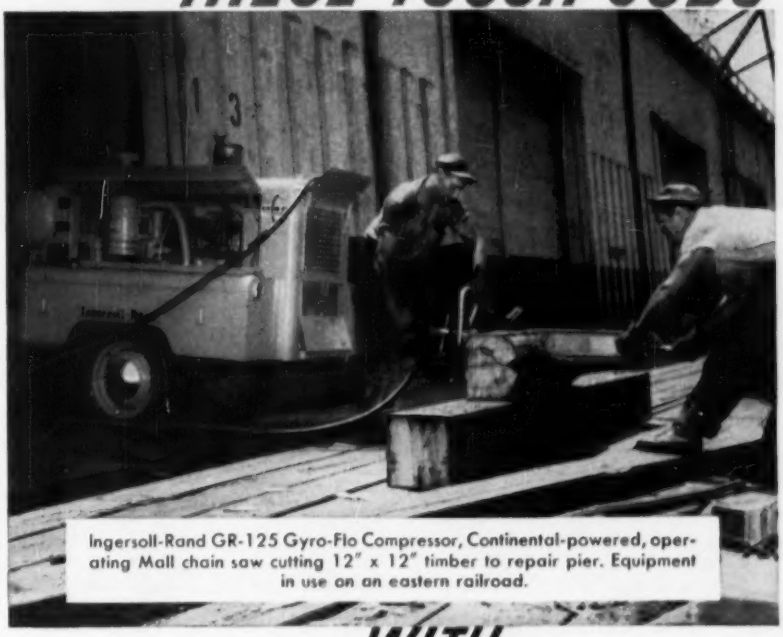
The answer is that the bright, ambitious, young engineers see this impasse ahead and get out of the design field. At a recent meeting of my university alumni group, a poll was taken, and out of 30 graduate engineers only one was in design work, and he was the poorest off of the lot.

If this agitation about keeping pace with Russia in development of engineers means anything, the heart of the matter lies not in educating engineers who wind up as insurance agents, but in making a decent career available for design engineers, with compensation commensurate with their ability and responsibility.

A. B. CARTER
Chicago, Ill.

SIR—Congratulations on your clear analysis of the reason for the widening gap in the supply of engineers and scientists between the U.S. and the

SPEED UP
THESE TOUGH JOBS



Ingersoll-Rand GR-125 Gyro-Flo Compressor, Continental-powered, operating Mall chain saw cutting 12" x 12" timber to repair pier. Equipment in use on an eastern railroad.

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MIGHTY MONSTER on the Mississippi

Photo Courtesy of Dravo Corporation, Pittsburgh, Pa.

Standing beside the giant Owen Clamshell is Mr. George S. Covert, Director, Louisiana State Highways

Building the new $65 million Mississippi River Bridge requires the varied skills and services of many contractors, construction men and a vast array of construction equipment.

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. . . Reader Comment

U.S.S.R. As you stated, one reason the U.S.S.R. has been able to make such tremendous technological progress is because of their use of the capitalistic incentives of paying engineers fabulous salaries in comparison with other Soviet incomes.

Your analysis ties in very closely with another problem facing the engineering profession today, namely that of the trend toward unionization among sub-professional and embryo engineers. Salary inequities seem to be the main reason for this trend. They are also directly related to the shortage of engineers.

After reading arguments pro and con about various aspects of this problem, I have finally reduced it to this: Pay professional engineers salaries commensurate with their responsibilities. There is a trend toward increasing starting salaries in the hiring of recent engineering graduates, but how about raising salaries of older engineers with their greater experience proportionately? Unless the older engineers' salaries go up along with starting salaries of newer engineers, we will be feeding new engineers in at one end, and the older ones will start dropping out in disgust at the other.

There are those who talk about greater utilization of existing engineers, according them more professional recognition, subsidizing promising students, and other related means of increasing the supply on the market. No doubt these suggestions, if followed, would be of considerable help, but I suspect that some of the proponents of these are the very ones who can't or won't see that the solution which offers the quickest results is a general upward adjustment in salaries.

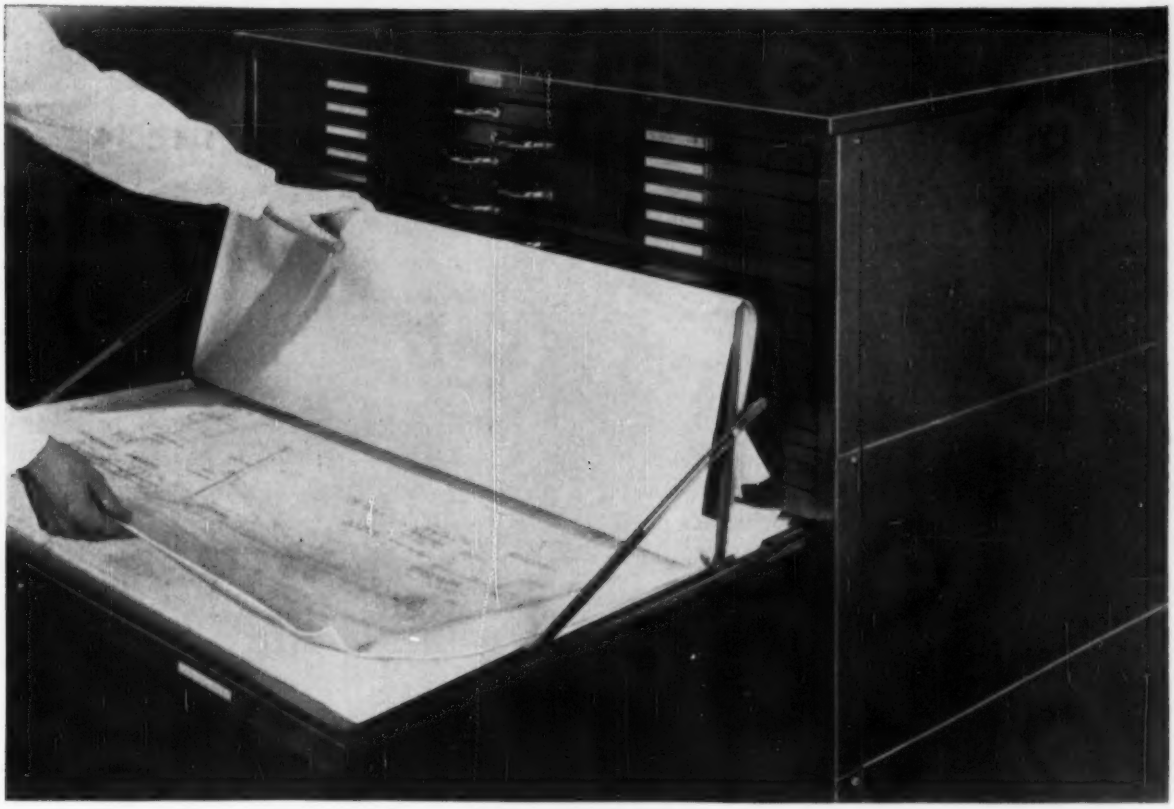
If the construction industry, for instance, can pay organized craft foremen up to three and four dollars an hour, why should they balk at paying comparable salaries to the field engineer who has to lay out their work, read their plans for them, lead them by the hand and do practically everything for them except actually issue orders to the workmen?

The writer expects that this controversy on the engineer shortage will continue until everyone who uses engineers realizes that companies which pay equitable salaries are having comparatively little trouble getting all the qualified technical help they need.

WM. C. STRASSER
Steubenville, Ohio

CALENDAR

American Society of Landscape Architects, 57th annual meeting, Cleveland Hotel, Cleveland, Ohio, June 24-27.



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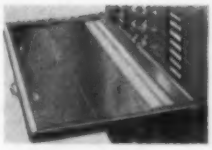
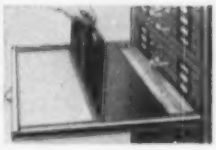


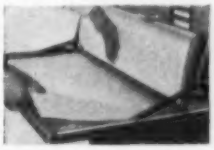
Keeps contents flat

Each drawer has a mechanical tracing lifter that also keeps contents flat when drawer is closed.



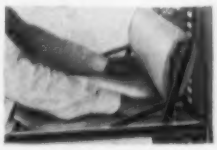
To find drawing

Raise front half of tracing lifter and locate desired drawing. Rear half still holds contents firmly.



Removing sheet

Sheets above desired drawing are turned over lifter and folded back. Sheet is easily removed.



Refiling sheet

Drawing is refiled as easily as removed—flat and smooth, ready for many future references.

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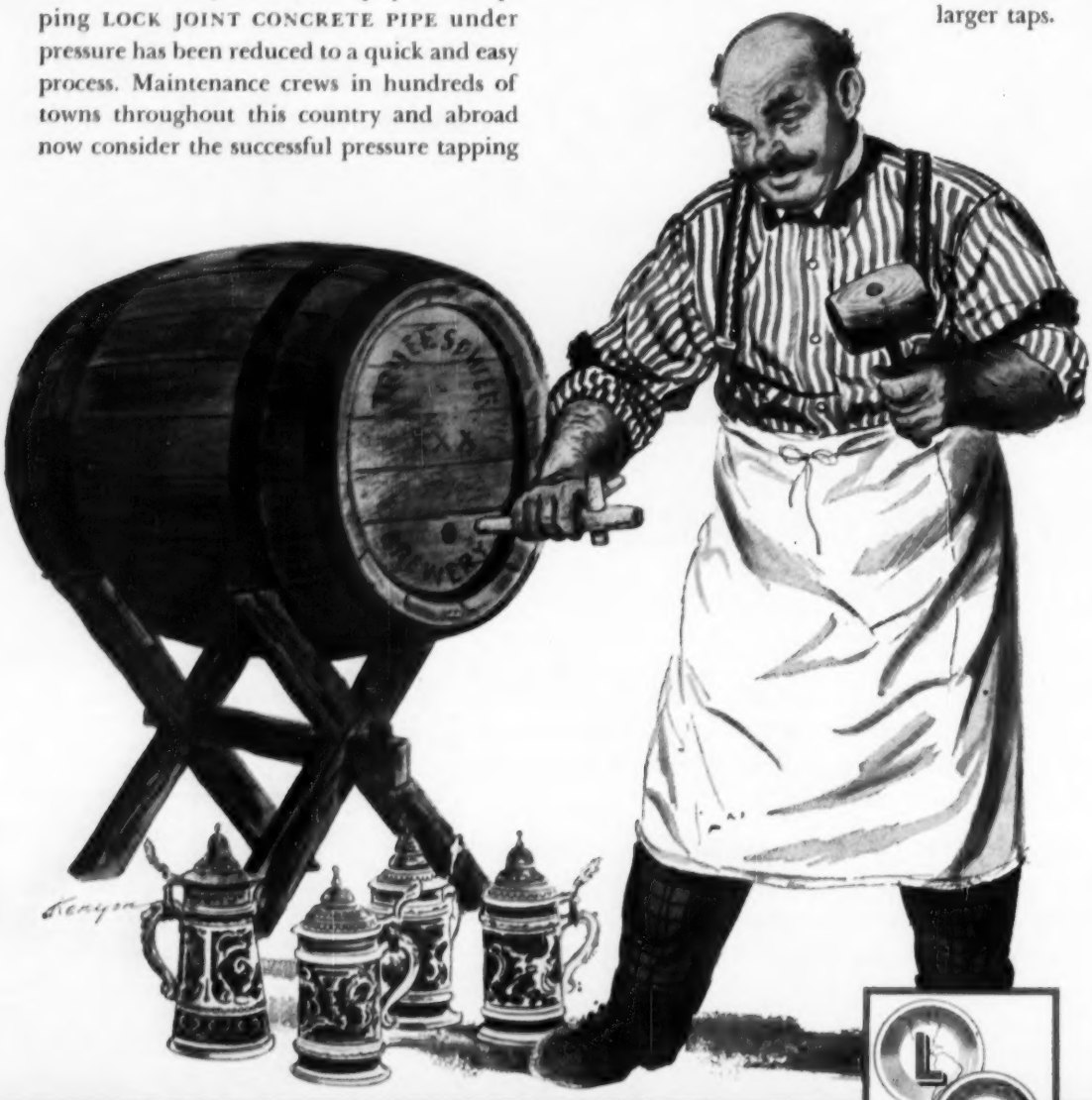

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ENGINEERING NEWS-RECORD

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THE CONSTRUCTION WEEK

A BOOST FOR CONCRETE TESTING—The Concrete Industry Board of New York City initiated a step that may have far-reaching effect in improving the quality of services rendered by testing laboratories. A resolution has been adopted by its board of directors recognizing testing and inspection of concrete as a profession and urging establishment of a code of ethics prohibiting bidding for performance of laboratory services. Next step is to persuade architects and engineers to write specifications precluding such bidding.

CLOSED BIDDING HALTED—The Pennsylvania Turnpike Commission has given up its practice of closed bidding for maintenance work. A warning by the state's Department of Justice (ENR June 14, p.17) forced the reversal of policy and rejection of three bids previously taken on an "invitational" basis for 40 mi of re-surfacing at a cost of over $2 million.

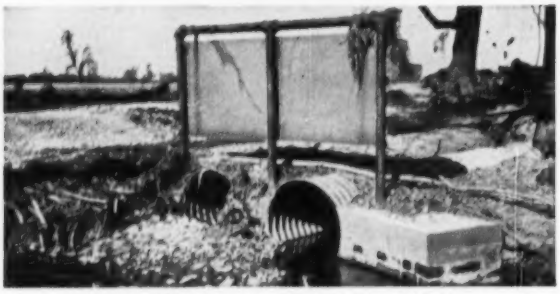
DETROIT BUILDING CODE—The "performance" type building code recommended by the Building Officials Conference of America got strong endorsement in Detroit. The city came up with its version of the BOCA code, after 12 years study of the municipality's needs by a committee of over 200 architects, engineers, building industry and labor representatives and professional society advisors. City Building Commissioner Joseph P. Wolff, a past president of BOCA, made adoption of the code an occasion to take some digs at so-called "specification" codes—terming New York City's code a "mire" and Chicago's "so bad I cannot even comment." But, he did comment to the extent of characterizing the latter as one filled with "requirements that represent special interests."

FINAL ROUND GETS ROUGH—Efforts of Delaware architects to win repeal of a 5% fee limitation on school construction work (ENR May 31, p.17) is giving the Delaware Legislature one of the most hectic sessions in years. As the issue neared a vote, a resolution was introduced that would require the state's attorney general to investigate "a certain group of Delaware architects" to see if their refusal to accept school jobs— stalling a $47-million program—is in the nature of a conspiracy involving criminal liability.

TUNNEL IN TROUBLE?—The 10-mi power tunnel of Aluminum Company of Canada's Kitimat scheme is acting as if there's an obstruction near its center. Alcan based this grave announcement last week on recent flow measurements in the 25-ft, unlined bore from Lake Tahtsa to Kemano. Dewatering of the tunnel is under consideration. While its present flow meets present power demands, future production at the remote, expanding aluminum smelter depends on full flow of this tunnel.

Twin Armco Pipes Are 49 Years Young

Twin Armco Pipes, installed in 1907, as they look today.



Flood in 1913 washed out the road, but left pipes undamaged. Same thing happened two years later.

In 1919 the pipe got a new concrete headwall and the highway was resurfaced with brick.

In 1907, these twin 24-inch-diameter Armco Corrugated Metal Pipes were installed under a well-traveled Ohio road. Today, 49 years and 2 devastating floods later, they are in excellent condition with many years of useful service life ahead of them.

Of course, this early installation of Armco Pipe was light gage and had only a galvanized coating for protection. Countless improvements have been made since then. Today, you can select from a variety of Armco drainage products and coatings designed to withstand almost any degree of loading, corrosion or erosion. Imagine then, how many more years today's improved Armco Structures should last compared with this 1907 corrugated metal pipe.

Durability is a feature of Armco Drainage Structures. Equally important is that Armco Structures have a low initial cost and allow installation economies. No special skill is needed for assembly; jobs go fast.

Armco Pipe is available in diameters ranging from 8 inches to 15 feet, in a variety of gages. Armco Pipe-Arch Structures are supplied in comparative sizes. Write for more data. Armco Drainage & Metal Products, Inc., 3716 Curtis Street, Middletown, Ohio. Subsidiary of Armco Steel Corporation. In Canada: write Guelph, Ontario. Export: The Armco International Corporation.

ARMCO CORRUGATED METAL DRAINAGE STRUCTURES

ARMCO

WASHINGTON OBSERVER

New estimates of cost of completing interstate highways in each state is a problem that highway officials face under the legislation Congress is voting as part of the big new highway program.

Congress wants new cost figures estimated on a uniform basis as a way of judging what changes, if any, to make in allocation formulas. Odds favor, as the House-Senate conference continued this week to work out differences in their versions of the bill, use of the present formula—which is not based on needs of each state.

Highway departments will have to report within two years according to present thinking.

U. S. and state officials are meeting next week in Kansas City to work out the rules and methods to be followed in order to produce the new estimates of needs by states.

•

Design standards for the interstate system are being adopted too at the Kansas City meeting. Work has been going on for well over a year. The planning and design policy committee of the state highway officials is working with top Bureau of Public Roads officials to have the standards ready for submission to state highway departments.

Some issues are still to be resolved, although agreement on the rules is almost complete. The regulations are officially submitted to the Bureau of Public Roads when 36 states approve what the policy committee recommends.

Final adoption of the standards by Commerce Department follows.

•

Final approval of the small projects bill is being held up by the Senate. The conference committee of senators and representatives approved a bill to the liking of the reclamation people of the Western states. It provides for interest-free loans to irrigation districts not part of a federal project. Idea is to encourage more private reclamation projects; Westerners say they can beat federal costs under such a program.

A bill in the works would give similar benefits to other states; and the Senate won't vote the reclamation bill until agriculture bill is also ready.

Millions of dollars of irrigation construction will be created if and when the bills are finally approved.

•

Federal government is trying to hire and hold more of its engineers. This applies to experienced men as well as the new graduate (see page 25). All told, federal agencies have on their payroll some 43,000 engineers of all kinds. They're out to take on an additional 8,700 in the year ahead.

This means boosting starting salaries for higher-paying jobs. Thus, an experienced man may start at, say, $7,035 for a particular grade, instead of the present starting salary of $6,390. Presently employed engineers in these grades would get the benefit of the boost, too.

Civil Service Commission is expected to give its approval.

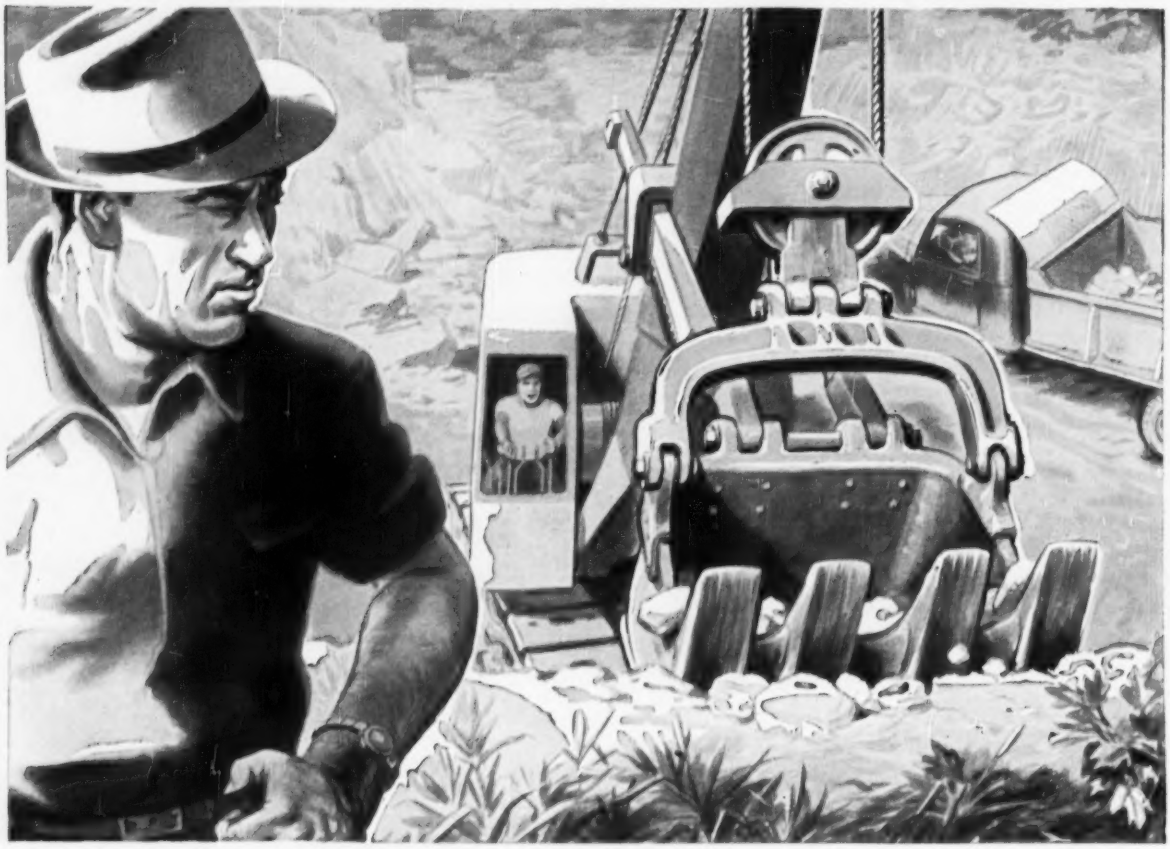
•

Bid shopping legislation is at one of its turning points this week. The House Judiciary Committee reported the bill—same as passed by the Senate—to the House Rules Committee for a ruling on whether the House can vote for or against the bill this session.

The experts figure that the House will approve if it gets the chance. The bill requires a general contractor who submits a bid on a federal project to list the principal mechanical subcontractors who will work on the job if he gets the award.

Administration sources hint Eisenhower may veto this one.

It's time to compare . . . with LINK-BELT SPEEDER



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The 1956 CE's . . .

- "Job-choosing" season is over for 4,400 civil engineer seniors
- They've been sought, wooed and won by employers who wanted them badly
- What affected their choices, and what will it mean to construction?

The New Grads—Where Did They Go?

An ENR Staff Report

"Where, oh where are the staid old seniors"—goes the old college song—". . . out, out in the cold, cold world."

But the "cold world" had a warm reception last week for the college senior, especially if he happened to be a graduating civil engineer.

All the world was waiting for him. In fact, it didn't wait; it went right into the colleges, found him, wooed him, and won him. In most cases, the job came before the degree for the class of '56.

Job-hunting this year was almost unknown. Job-choosing was the young senior's problem. And a real problem it was. For the jobs were many, the recruiting was fierce, the enticements were attractive. It was hard for a young man to keep a level head.

Now that it's over, and nearly all of the class of '56 is placed, it is noteworthy that for the most part the civil engineer graduates seem to have chosen wisely. The various elements of the construction industry have recruited about in proportion to their needs. Evidence gathered would indicate that the construction agencies needing help most managed to get their shares.

Opportunity, location and salary. Those were the job attractions—and in that order.

College officials and placement bureau managers in ten schools visited by ENR, stressed the point over and over that salary alone was not buying the affections of this year's graduates. They stressed this in the face of figures that showed average starting salary for civils somewhere over $420 per month. They had the facts and figures to prove how few actually succumbed to the $500 to $600 (with overtime) enticements of certain industries (mostly aircraft companies seeking stress analysts).

There are several other generalizations safely made from the stories filed by ENR reporters who visited the colleges, talked to the graduates:

- The construction industry in general sought civil engineering students this year about as actively as other industries sought other groups among the graduates.
- Construction agencies had stiff competition not only from aircraft companies, as usual, but also from other industries seeking the broadly educated civils for conversion to their particular needs outside civil engineering.
- Within construction, the public agencies, notably highway-building agencies, were more active in recruiting than in the past; contractors were successful in attracting good numbers (with good pay); consultants did practically no direct recruiting but were successful in having professors do a proselyting job for them.
- The federal government, generally, fought a losing fight for needed engineering manpower. Basic problem: inability to match other offers either in starting pay or opportunity for advancement (see also p. 25).

These were some general conclusions. The complete story is presented further in what ENR reporters were told at ten of the nation's leading engineering schools, where they talked to deans, heads of departments and to the graduating seniors themselves. Altogether it adds up to who got the class of '56, how they got them, and why they got them.

M.I.T.

At Massachusetts Institute of Technology, civil engineering graduates found themselves blessed with a banner crop of placement opportunities. But, despite the list of attractive job offers, upwards of 30% of this year's class will undertake graduate study of some sort. As for the balance, another third will take jobs in consulting firms, while the remainder will be spread among government contracting, and industry (see charts next page).

While the competition among firms

seeking personnel has not been quite so fierce here in the case of civil engineering grads as has been noted with aeronautical and electronics majors, the demand exceeded supply by a significant margin. The average number of interviews was seven per student, with some students receiving as many as five definite offers. Every member of the class, with the exception of those planning graduate study, was successfully placed.

Salary, still a natural consideration in the choice of the graduate's position, was by no means the dominant factor. In choosing their jobs, the students placed more emphasis upon opportunity, interest, and location, giving the dollar-sign a back seat in importance.

Prof. John B. Wilbur, head of the civil and sanitary engineering department, pointed out that the average starting salaries of his students topped the figure for students in all other departments at MIT, with aeronautics a close runner-up.

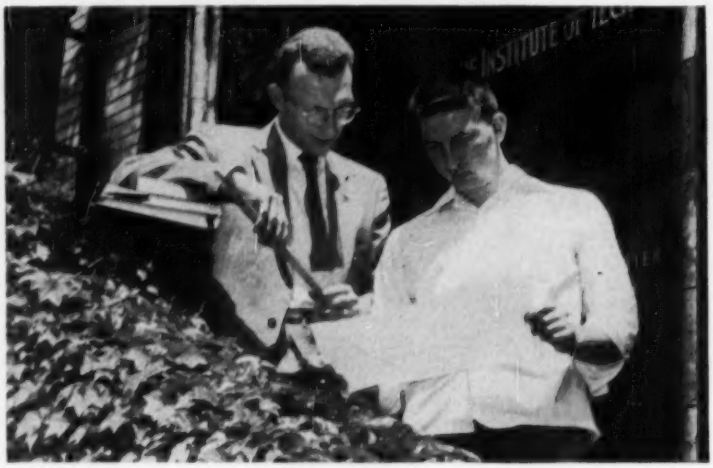
Lehigh

Demand for graduates here was greater than in the past four years. And the heaviest demand was for engineers with some business training. The demand should keep up, too, for the interviewers who besieged the campus set their dates for next year's campaign before leaving.

More industries appear to be hiring young men into training programs, through which the idea is to locate them eventually in the most suitable job in the organization.

It is obvious here that employers don't concern themselves with the graduates' obligations to Uncle Sam. They hire even with military service in the offing in hopes that their men will return.

Civil engineers are averaging $421 per month, with veterans getting another $50 in most cases. The veterans are more influenced by location in choosing a job, for they are more apt to be married. (It has been reported that 45% of this year's college graduates are married or about to be.)



What they looked for . . .

"Not one man in this class took his job on the basis of salary only."

"I looked in ENR for firms with big awards in highway and heavy construction, wrote to them, and got offers from all of them."

"The chance at management was what finally made my decision."

"He has been interviewed by a number of companies, but he is interested in a consulting firm job for which no interviews were conducted."

"He liked the 'family feeling' among the personnel."

"The graduates want to get into an expanding industry—they look to the future, not to the past."

"The aircraft companies sell you. You don't sell them. It was not promising. I would end up as a number in an office."

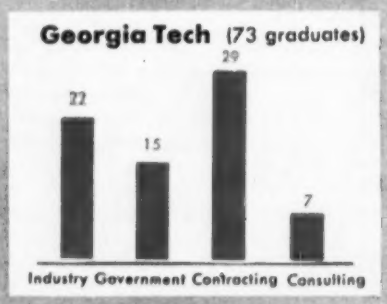
Asked whether civil engineering is holding its own at Lehigh, Prof. Raymond Snyder stated: "Industry (other than construction) is better organized to recruit. Engineering companies and societies haven't broadened their appeal."

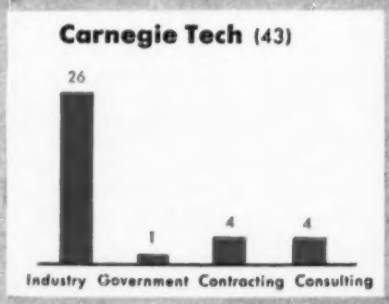
Graduate John C. Milnor, 24, had this to say: "I looked into five state highway departments. Michigan had the highest starting salary." Milnor, still undecided, didn't find highway jobs too easy. "Most of them called for 2 to 5 years of experience."

The professors push working for consulting firms for broad experience to help the young man decide on his field, said Milnor. He had offers from

Here's where the holders of bachelor's degrees in civil engineering went from five representative engineering schools.

(Figures do not necessarily add to totals since graduate studies and armed forces are not included.)





. . . And what they were offered

"One firm started this year offering to pay those who signed with it one-half salary from the time of signing, to graduation."

"I got a three-page telegram telling me what this particular firm would do for me in the way of moving expenses."

"One civil engineer was offered $680 a month by a Florida contractor for whom he had worked during summer vacations. He turned it down."

"Even the state highway departments, traditionally low on salary, are gradually being forced up."

"The idea of 'big money' favoring the branches other than civil engineering does not hold up at MIT."

"They went to $425 when they heard my other offers. They pitched me pretty hard."

three consulting firms—all under that of the Michigan Highway Department.

Kansas University

There were 109 employers looking for the 15 civil engineering graduates at K. U. this year, so each man had a chance at about seven, eight or nine jobs. If they took the jobs they have historically taken, 40% went to consulting firms, 50% to industrial firms, 7% to government and 3% to contractors. K. U. officials don't get the exact breakdown until after graduation.

A tendency of industries to hire engineers without regard to their branch of study was evidenced. Twice as many aircraft companies sought civils as sought aeronautical engineers. As explanation of this, Dean T. DeWitt Carr says: "We graduate men who have the fundamentals of engineering. The industries are learning they can take almost any engineering graduate and make out of him what they want."

The veteran gets the most pay; most companies base starting salary offers on the experience the young man may have picked up prior to graduation. K. U.'s average for civils: $420 per month.

B. W. Alpert was No. 2 man in the class, married and 24 years of age. He goes to the Missouri Highway Department for $413 per month and a possible $20 raise after six months. Fourteen employers interviewed him. He didn't want to move out of the area.

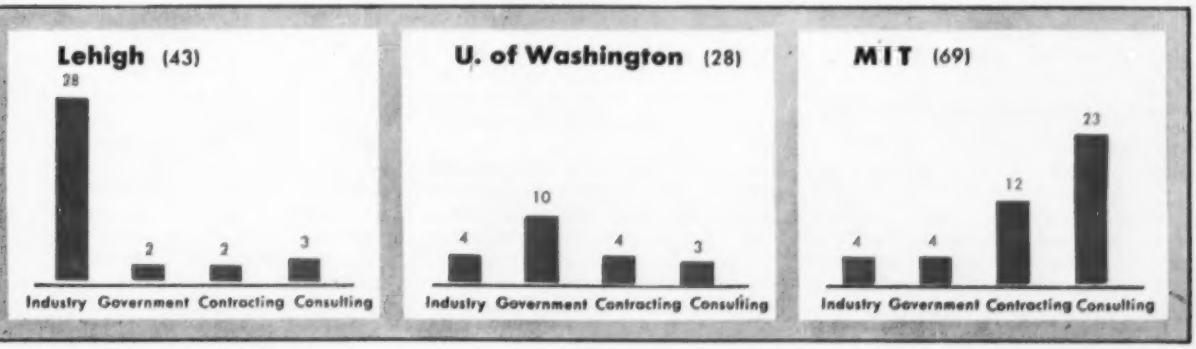
Dean Carr undoubtedly has an influence on his boys; he's a strong advocate of the Midwest as "the coming part of the nation." Many of them take his counsel, take jobs close to home.

Carnegie Tech

With a graduating class second in size only to the post-war high of 1950, Prof. Frederic T. Mavis, head of the civil engineering department, found the job situation so favorable that even sophomore and junior students in search of summer employment were placed without exception.

Breakdown of the positions taken by the graduates showed that careers in industry were most attractive to the Tech CE's, with specific preferences mainly in design and sales. Despite the lure of high salaries offered by the aircraft firms, many of the students interviewed turned down jobs for fear that they would lose their individuality or that their work would lack interest.

Stiff competition for this year's graduates was evidenced by the high level of salaries, extended benefits, and inducements which parallel the instance of "bonus babies" in professional baseball. In several cases, stu-



dents found themselves the objects of competitive bidding, as firms began wiring increased salary offers from week to week. Scholastic achievement alone seemed to have relatively little bearing upon the graduate's salary. At Tech, the second and third highest offers were received by two of the lowest men in the class.

While employers seemingly scorned academic prowess in making their salary scales, the graduates showed a similar lack of concern for these scales in selecting jobs. Said Prof. Mavis, "Not one man in this year's class took his job on the basis of salary alone."

Prevailing offers for CE graduates at Tech equal or exceed those for other branches of the profession and are $45 to $50 higher than last year's figures.

Ohio State

Industry tossed caution to the winds in a mad scramble for this year's engineering graduates, but "our students remained practical and sensible," said Lilvan B. Bradshaw, placement director for Ohio State University's College of Engineering.

Salary was held secondary, but none will starve.

Employers started making overtures last October, and it got so bad the university had to halt all recruiting in March. "The students were becoming confused," said Miss Bradshaw.

Mechanicals, chemicals and electricals got the big play, but there are indications civil engineering may be staging a comeback among the glamour fields.

The top CE this year, R. L. Treherne, said he had fifty inquiries before he chose Chicago Bridge and Iron Co. He's a steel enthusiast and hopes to get into bridge design and, eventually, administrative work.

Rodney Rawson, a veteran with some experience, chose a small consulting firm as a place for continued learning. He turned down one good offer where the numbers of young men who would be ahead of him didn't leave much room for future opportunity.

University of Florida

The great amount of construction being undertaken in and around Florida has kept many of this year's civil engineering graduates right in their own back yard. According to Prof. R. W. Kruge, head of the department of civil engineering, the percentage of CE students has kept pace with the overall enrollment rise. Reason for this is the large volume of construction projects plus a natural liking for the outdoors.

Preferring Florida sunshine and lower tax and living costs to larger pay checks, many of this year's graduates have turned down out-of-state offers which averaged $150 per month higher than those of local firms.

Most popular job choice for the Florida CE grads was government work. Besides the location aspect, Prof. Kruge thought that expanded state highway programs and the desire for job security and public service influenced this preference. One student rejected a position with a contracting firm at $680 per month on the basis that he would be acting more as a construction boss than an engineer and would have little chance to apply his newly gained engineering knowledge. Students were surprised at the small number of consulting firms looking for men. Only a single member of the graduating class wound up on a consultant's payroll.

Georgia Tech

Fred Ajax, who directs this school's Central Placement Service, really does a job. In November, he presented his "offering" of 1956 grads to a mailing list of 8,327 companies and government agencies. From then on his work was cut out for him in lining up interviews. By May 16, he was "sold out"—including even those who will not get their degrees until next December.

In all there were 26,612 individual interviews and 10,000 plant trips by engineering students of all types at Tech. Ajax already has his next year's interview program booked solid through next April 17.

At Georgia Tech., CE's this June hit just about on the average of all branches for pay—$421 per month. Last year it was $395, and Ajax says next year it will be $432. He's an expert on the subject.

About 70% of the graduates are obligated for service to Uncle Sam sometime in the future, but this doesn't seem to mean that prospective employers prefer the other 30%. Some large firms offer the young man a portion of his salary while he serves his stint.

In spite of all that's written and spoken about the paucity of engineers, some employers are unbelievably naive. One Tech student this spring was offered a $250 per month salary.

At the other extreme a well-known (but unidentified) firm offered half-pay until graduation—a $1,435 bonus in some cases. Ajax says the boys resent this approach. Their total reaction: "Am I really going to be able to justify all this when I'm out on the job?"

Northwestern

The Technological Institute of Northwestern University played host to some 400 interviewing companies this spring. While many were interested in hiring specialists in electronics and similar fields, a good number were looking for men of broader engineering background, civil engineers. Graduating CE students were treated to a wide choice of employers to choose from, and offers as numerous as a dozen per man were not uncommon.

The largest number of job opportunities here came from construction with aircraft and oil companies next in line. Representatives of consulting concerns were conspicuous by their absence. Students who had their minds set on working for consultants were faced with the prospect of contact-making and leg-work, and their efforts did not prove too successful.

About one-third of the current graduating CE's are looking to advanced study in one form or other; teaching competes with industry for their attention. Assistantships and substantial opportunity for advanced degrees are attracting more young men to the teaching profession than ever before.

For the men taking jobs "on the outside," salaries for the CE graduates were good. Based on average figures, the civils received offers second only to the ME grads.

Prof. John A. Logan, head of the department, attributes the increased interest in CE grads to the growing recognition of the broad background afforded the student civil engineer in his scholastic work. As for the students themselves, this same insight into the potential worth of CE education, coupled with the motivating force of an opportunity to make a real contribution to society as a whole, are chiefly responsible for growing CE enrollments, according to Prof. Logan.

U. of California

This June's civil engineering graduates were almost equally assimilated by consulting firms, construction companies, governments, graduate study and Uncle Sam. Of those who could be polled, the largest number (nine) had chosen to go into government positions, three with the state and six at the local level. Only four went to industries.

According to Prof. Harmer E. Davis, chairman of the civil engineering de-

partment, recruiting for CE's was "just as active" as for others. Davis believes civil engineering has lost some of its appeal in this jet-plane and rocketship age, but he also believes technicians can help fill the gap—as in the California Highway Department which employs 2,000 subprofessional and 3,000 civil engineers.

Average monthly pay for all engineers out of U. C. this year is $450 per month, with CE's ranging generally from $410 to $480.

An exception to this salary range is 23-year old Joseph Burton, top man in the class, married, and an experienced hand with the Southern Pacific Railroad. A rail-fan from boyhood, he'll go back to the road as a general track foreman at $600 per month.

Lowell Patt, another married U. C. grad, chose Tidewater Oil in San Francisco. "I never thought I'd be designing service stations," Patt admits, "but this position appeals to me because the project is yours from start to finish."

U. of Washington

Competition for other types of engineers may be more spirited as far as the top individuals in each class are concerned, but U. of Washington officials believe that otherwise the recruiting for civils is now about as keen. Firms needing civil engineers don't pay as much attention to grades or standing in the class. Even the low man in the class could get five to ten job offers, if he'd listen.

Thirty-minute job interviews here were often followed by lunch, or dinner, and trips to the home office that ranged as far from Seattle as San Francisco and Salt Lake City. Inducements sometimes included moving expenses and aid in finding homes.

Los Angeles County was the most successful recruiter this year, with offers of $463 per month.

Kjell Bakke, not the best student, didn't submit to a single interview. He's been working with the U. S. Forest Service out of his home town in the Cascade Mountains for the past five years. He chose civil engineering over forestry education for the higher pay, but he'll stick to the outdoor life in an engineering job for the Forest Service. He'll make $4,080 a year and figures an eventual desk job with the service has advantages over an aircraft job with higher pay now.

ENR's staff man who went to U. of Washington reports: "I question the effectiveness of present recruiting methods. Of three students interviewed, only one was open to a job offer. Some recruiters start in October. It would seem that they'll have to reach the students even earlier."

Who got the class of '56? . . .

The Federal Government Didn't

Government services were hard put to recruit the young engineers they needed from among the 4,400 civil engineer graduates this June. Their limitations of pay and promise left little ground for maneuvering in the competitive fight for the class of '56.

The dwindling intake of engineers has become a major concern of executive officials and Congress. They are doing things to improve the weakest competitive feature—the federal pay scale for engineers and scientists. Aside from the salary schedule and the scarcity of top-bracket posts for engineers in government, the federal agencies have plenty of advantages to offer new engineering employees.

The federal engineering and construction organizations, of course, will have to make do with this year's infusion of young engineer talent. But a number of them, including vital defense arms like the Corps of Engineers, cannot maintain full effectiveness indefinitely without a vastly increased inflow of graduating engineers.

• **Corps suffers most**—As the biggest engineering organization in the federal establishment, the Corps suffers more severely than any other agency in a period of engineer shortage. With a staff of 8,200 civilian engineers plus 9,000 commissioned officers in the Corps, the shortage hits the combat-construction organization doubly hard. There are now 7,000 reserve officers on active duty, with 2,000 regular officers.

For its new junior officers, the Corps has to depend mainly on ROTC graduates.

Last year it didn't quite get the 50% minimum of engineers it needs among some 1,500 ROTC graduates commissioned. The Corps retains only 10% of its junior officers as compared with 20% for the Army as a whole.

Equally critical to the Corps is the loss in civilian engineers, both at the input end and among the upper grades of highly trained personnel. To maintain its staff of more than 8,000 professional engineers, the Corps should be taking in 500 or more engineering graduates each year. An intensive recruiting drive last year aimed for a minimum of 300 but brought in less than 200. This year, despite a continuously active campaign on the college campuses, the Army Engineers fear the figure will fall to about 125.

• **Student programs help**—Federal agencies that require annual recruitment of engineering graduates in fair numbers make use of student training programs to develop good prospects during undergraduate years. The Corps of Engineers takes on undergraduates through its district offices for summer work and also carries on cooperative training with five schools that give this kind of course. It hopes soon to add four more.

Among the most successful student training programs are those run by the Bureau of Reclamation, the Soil Conservation Service and the Bureau of Public Roads. The first two give conditional career appointments for summer work after students have successfully completed one year of engineering.

Reclamation, with an engineering staff of about 2,100, has been able to recruit nearly 60 beginning engineers from among college graduates this year. The bureau's student training program also has come back to vigorous life with some 350 enrolled this summer, after three years during which the reclamation program was going downhill and the working force was being reduced.

A similar student training program has been in effect since 1948 in the Soil Conservation Service, which employs nearly 900 engineers, and has well over 100 trainees.

Public Roads, with some 1,100 engineers on its multi-faceted highway staff, also needs to recruit about 75 college graduates a year. Last year it got just under 40 and this year about the same number.

Comprehensive training courses for college graduates who take permanent positions are a valued incentive. In some cases, engineers can move up to higher salaries in the $5,000 bracket while taking these courses.

On fringe benefits—retirement, insurance and vacations—the federal agencies can compete with industry. But, there is little room at the top for civilian engineers, particularly in the military services, where officers fill the engineering executive posts.

Congress, however, is in process of passing a law that will create more than 300 additional posts paying $10,000 to $15,000 a year for professional and scientific people, many of which will be open to engineers. The pay scale may even be set at $12,500 to $17,500, though that is doubtful. The new positions go 215 to defense, 50 to the National Advisory Committee for Aeronautics, 35 to Commerce and 10 to Interior.

Toll Changes

Penn. may postpone toll changes until November 15

Pennsylvania Turnpike toll changes can be postponed until Nov. 15, Turnpike Commission Chairman G. Franklin McSorley told a State Senate investigation committee on June 13.

And at that time they may apply only to the Delaware River extension, which is in financial trouble, McSorley advised senators investigating the proposed $4-million-per-year toll hike for the entire system (ENR May 24, p. 24; ENR May 31, p. 25).

The commission chairman explained that he has found a way to "transfer" construction funds into a sinking fund to handle interest charges due on bonds in December, thus avoiding a fiscal crisis.

The critical situation has developed on a portion of the turnpike east and northeast of the Valley Forge interchange that was financed under a 1952 underwriting. Revenues on this portion have not met requirements of the loan, and since revenues and surpluses of the financially healthy Valley Forge-to-Ohio State-line portion cannot, under present legislation be diverted, the toll change was proposed to take up the slack.

• **Refinancing the answer?**—State Senator Robert D. Fleming, chairman of the Senate committee probing the need for toll increases on the turnpike, has suggested refinancing the turnpike to avoid higher tolls. This would involve calling in the successful 1948 indentures, along with foundering 1952 indentures, and combining the two offerings to form a single bond issue in order to solve the difficulties.

Fleming's suggestion would require state legislation, however, and since the General Assembly does not meet in regular session until next January, the present plan of the commissioner to transfer construction funds to a sinking fund to meet Dec. 1 interest on the 1952 indenture may be resorted to.

The current toll structure survey, started on the 'pike's own motion last August, resulted in recommendations for a 41% boost in passenger car tolls and an average 20% reduction in truck tolls.

• **Nobody's happy**—The recommendations met with such opposition from truckers (Pennsylvania Motor Truck Assoc.) as well as from the Pennsylvania Motor Federation (AAA), representing passenger car owners, that the original toll-raise date, May 25, was set back to July 15th, and then indefinitely.

Truckers stated that the average 20% reduction was, in truth, an increase, because truck rates had been raised in those sections that are being most used by their trucks and lowered in least used areas.

Spokesmen of three trucking companies claimed that their firms would like to use the turnpike for the long hauls, but that the only sections that have been open to them on a cost-per-mile basis were those between Irwin and Carlisle—about half the total turnpike distance. In this mountainous section, according to the truckers, the tolls were being raised, while tolls in the flatter sections were being reduced.

Meanwhile, truckers, motor clubs, bondholders and bond underwriters are reviewing their positions, and it is expected that they will press for a new study of the tolls before July 15.

RADIOACTIVITY:

The engineer's part of the problem

The problems to be faced by engineers and builders with the advent of the industrial atom were brought into sharper focus last week in a report by the National Academy of Sciences. Entitled, "Biological Effects of Atomic Radiation," the bulky report sums up the finding of more than 100 eminent scientists and engineers approaching their subject with studies varying from genetics to sanitary engineering.

For engineers, the report contained these main points:

• The most immediate headache faces the many industries dependent on uncontaminated water supplies. The Committee on Disposal and Dispersal of Radioactive Wastes—headed by Johns Hopkins University's Prof. Abel Wolman—described the problem this way:

• Basic Problems Cited

"Numerous wet-processing industries are likely to be detrimentally affected by radioactive wastes even in trace concentrations.

• The question boils down to safe, and economical disposal of radioactive wastes—mainly the fission products given off by atom-fueled reactors. The dimension of the problem shows up in these committee estimates: By 1965, U. S. reactors will produce 200 lb of fission products daily. The figure will climb to 200,000,000 per day by 1980, jump to 2,400,000,000 lb per day by 2000.

None of the radioactive wastes produced to date at Atomic Energy Commission plants have been effectively neutralized. They are now stored in tanks—an "interim solution" only. "The atomic energy program," the report warns, "will soon present an unparalleled problem in storage. To keep our general surroundings habitable, enormous quantities of waste products from nuclear fission will have to be tightly contained for long times. Past experience gives only a pale intimation of what is to come."

• No Solutions Given

Lacking such guides, the report spots only the problems—gives little hint of the answers. The problems include:

Development of an economically feasible disposal system—research and barely scratched the surface here.

Legal and insurance protection for corporate owners of waste products who may not be around through the centuries it takes for some fission products to reach a safe level of radioactivity.

Determining the best locations for reactors and, more importantly, for the plants processing reactor fuel.

Finding a safe method for moving large quantities of radioactive material; learning what parts of the earth—and sea—are suited to storing them.

The report sees a potentially fruitful field for a new waste disposal industry—made of firms that would specialize in the handling, removal, transportation and storage of atomic wastes.

• Precautions Maintained

Until reactors can be built to reduce such hazards, the report urged that those put up in populous areas be "enclosed in sealed buildings, strong enough to withstand pressures."

This means that the expensive safety measures now required by the Atomic Energy Commission of reactor builders are not likely to be eased.

The Wolman group made a plea for "careful, integrated planning—obviously it will not do to let nuclear plants spring up ad lib over the earth."

And, it admitted that "a large part of the information that is needed to make intelligent plans is not yet at hand. There is not much time left to acquire it."

Who Owns Lift Slab?

No simple solution seen in California court case

Two cases involving rights to the so-called "lift slab method" are currently pending in Los Angeles courts.

The first to come up for judgment—U. S. Lift Slab and its licensee, Vagtborg Lift Slab Corp. vs Western Concrete Structures Co. and others—has been set for trial in Superior Court on July 16.

Charging Western Concrete with violation of confidential disclosures, trade mark infringements, misleading advertising, and unfair competition, Lift Slab has asked the court to restrain the defendants from any further operations resulting from "confidential disclosures" made to them by Lift Slab on the "lift slab," which it charges "has acquired secondary meaning" (i.e., identification with the plaintiff's product). In addition, Lift Slab wants to recover for alleged damages to its reputation and business, which it claims were suffered as a result of the defendants activities.

Western's answer: A countercharge of libel, attempted monopoly and price fixing, and a damage claim of its own totaling nearly $1 million.

Basically the suit hinges on certain conversations between the plaintiffs and certain individuals who later formed Western Concrete Structures. Lift Slab charges that during these talks, held, it says, for the purpose of initiating a joint venture to combine its "lift slab" ideas with the prestressed concrete process of the defendants, certain confidential trade secrets and equipment designs were disclosed.

These trade secrets were acquired in 1953, says Lift Slab, from Southwestern Research Institute, a non-profit research and development organization, which in turn had acquired them from the originators, Philip Youtz and Thomas Slick, and subsequently spent some $700,000 to perfect them. Furthermore, says Lift Slab, licensed contractors have paid some $350,000 for the right to use them, in construction of well over 6,000,000 sq ft of buildings.

When the "joint venture" failed to materialize, Lift Slab continued in the complaint that these disclosures were incorporated "in plan and in principle" into the operations of Western Concrete Structures. However, declares Lift Slab, the defendants did not get all the information, and as a result of allegedly incomplete data on certain refinements and safety devices, their activities are "endangering the lives of the public" and are also impairing the reputation of Lift Slab and its licensed contractors.

While admitting certain conversations took place, Western Concrete denies any data was revealed "which they and the building trade did not already know." Besides, the company retorts, "U. S. Lift Slab does not have," as represented by them, "a legal monopoly, by reason of patents or otherwise on the method." As for the term "lift slab," these are just ordinary English words.

Says Western, Lift Slab has injured our business by threatening our customers with delay and involvment in litigation, unjustly inferring that our method and equipment is untested and unsafe and conspiring to induce state agencies to refuse permits and reject our bids. As to unfair competition, Western continues, they are violating state and federal laws in an attempt to restrain trade and surpress competition through performance of "lift slab" services below cost, creation of locality price discriminations and the use of misleading advertising on patent claims.

With both sides denying the charges, no early solution is seen.

Meanwhile, a second suit against Western Concrete, with inventor Youtz as plaintiff, is in the preliminary stages in federal court.

The latest development in the suit, which hits directly at the more basic question of patent rights, is an order from Judge James Carter that Lift Slab be added as a party to the plaintiff.

Storage Site Found?

Potential water and power Producing area discovered

A Spokane, Wash., engineer thinks he has located a water storage site previously overlooked—one that could store 4,500,000 acre-ft and produce 696,000 kw from its own generating facilities. The site would supply downstream flow for added generation of 600,000 kw, and flood control of 38,000 cfs, roughly the flow of the Pend Oreille River at normal runoff.

Fantastic as it sounds that even a potential bucketful of storage has been bypassed, the Corps of Engineers believes there is enough merit in the scheme to order it studied.

The engineer, Carl R. Dion, visualizes two earth and rock dams to store water in Omak and Goose Lakes in Washington. The lakes lie in a dry riverbed which would become a reservoir when dammed. The reservoir would be connected to Lake Roosevelt behind Grand Coulee Dam, by a pair of canals, and would store water from 29-mi lake.

During high water, overflow from Lake Roosevelt could be pumped into the new reservoir, and during low periods, it could be drawn down. Dion sees a powerhouse located on Lake Rufus Woods, the reservoir behind Chief Joseph Dam, with reversible pumps to permit taking water from it or putting water in. The scheme will cost $195 million.

Wide-Area Sewage System Is Proposed

A $37.5-million program to provide sanitary sewers for 130,000 people living in a 34.5-sq mi area ringing Nashville has been recommended by the Nashville and Davidson County Planning Commissions.

In effect, the two commissions also embraced the idea of consolidating Nashville and Davidson County into a single governmental unit.

"The sanitary sewer system," they said in a 96-page report, "should be under the administration of a single governmental jurisdiction covering the total metropolitan community."

This system, it was emphasized, should be part of an integrated water supply and sewage disposal system for the entire community.

The report, representing 18 months of work by the commissions' joint advanced planning staff and released after numerous delays, made these other major points:

- The program recommended involves immediate construction of 134 mi of trunk sewers, 480 mi of collector sewers, three sewage treatment plants and 20 pumping stations.
- Trunk sewers will be adequate in capacity to permit their extension into a system of trunks and collectors to serve an ultimate program area of an additional 90 sq mi whenever such a system is warranted.
- Financing of the $37.5-million cost of the immediate program may be by revenue bonds, with monthly service charges; by general obligation bonds, with increased property taxes; or a combination of these procedures.

Proponents of the plan expressed hope for action on the proposal by the 1957 legislature. The law permitting a contract between the city and county has been on the books since 1953, and no action has been taken under it.

The report does not set a timetable for completing the sewer construction. As for priorities, the report "suggested" first attention be given to the trunk sewers (including the treatment plants) and second consideration be given to the collector system.

Niagara Rock Slide

Damage estimates revised, debris removal is started

Although the Niagara Mohawk Power Corp. reported last week that the loss resulting from the rockslide that destroyed two-thirds of the Schoellkopf Station at Niagara Falls could not exceed $20 million, determination of the exact loss awaited reports of engineers and geologists.

Inspection of the crushed, 300-yd long station awaited removal of debris, which in turn awaited damming of the power canal above the plant.

Niagara Mohawk engaged the McLain Construction Corp. to block off the flow of water in the canal where it branches off the river about a half mile above Niagara Falls. The McLain firm, which last fall completed the government remedial project on the American Falls, almost immediately began working around the clock, fabricating cribs to form a cofferdam.

The Bethlehem Steel Co. plant at Lackawanna, 35 miles from Niagara Falls rushed through an order for 600 lengths of steel piling, each 30 ft long. H-beams were welded to form cribs 30-ft high and about 22 to 25 ft. wide. They were lowered into the 26-ft deep canal and filled with rock. After the cribs spanned the 125-ft canal, sheeting sections were welded in place and work of backing up the cofferdam with additional rock continued in the 10-mph flow.

• **Two sections destroyed**—Schoellkopf Station is made up of three sections: 3A, 3B and 3C. Section 3A, the oldest section, has 13 units at 10,000 hp and two at 1,000 hp. Sections 3B and 3C were destroyed in the slide; 3B had three 37,500-hp units; 3C had three 70,000-hp.

Workers lowered by harness equipment to search for the body of a man who was caught in the slide, said they could see badly damaged and partially melted generators. These were the six units of sections 3B and 3C. The fifteen others of section 3A escaped the slide but were under water.

That part of the station, spared by the rockslide but flooded to a standstill by unchecked water, receives water to turn its turbines from an underground tunnel. The tunnel, 4,400 ft long and 32 ft in dia, brings water from the upper river under the City of Niagara Falls.

The station produced mostly 25-cycle power for the huge chemical industry around Niagara Falls. If the company rebuilds on the site, it faces the difficult decision of whether it will develop 25-cycle or 60-cycle power. To change the 60-cycle would mean many of the industrial customers would have to change over at a cost of millions of dollars.

Estimates of damage were scaled down to $20 million by President Earle J. Machold of Niagara Mohawk. Another official of the corporation earlier had set the figure at $100 million. Mr. Machold is talking depreciated book value of the old plant. The larger estimate might well have been a replacement value.

• **Congress asked to act**—like the roar of the slide that cascaded thousands of tons of rock on Schoellkopf Station, the political interests involved in the fight on future development of Niagara Falls power were quick to sound off.

Sen. Herbert H. Lehman of New York, sponsor of the Niagara Power Development bill already passed by the Senate, said the disaster makes it imperative that the House move swiftly to pass the bill. It would give the state of New York the necessary title and authority to build its own power plant near the Falls.

Gov. Harriman of New York called upon the President to order federal agencies to make an immediate survey of rock conditions along the Niagara River to prevent a recurrence of the slide.

Still Another Power Failure

The southern half of Vancouver Island, B. C., was blacked out and some $10,000 worth of damage caused when a 12-ft dia wooden penstock burst above British Columbia Power Commission's John Hart Dam at Campbell River June 13, sending flood water cascading down the mountain.

Water then tore out the foundations of a second penstock and four of the powerhouse's six 15,000-kw generators were forced out of commission.

The break started when penstock staves worked loose. The penstocks collapsed when leaking water gouged out foundations. A total of 1,500 ft of penstock must be replaced.

The incident was BCPC's most serious trouble since the Whatshan disaster of 1953 when another penstock was to blame for collapsing a section of mountainside, causing $6 million wreckage to the powerhouse (ENR Nov. 12, 1953, p. 60).

Ohio River Toll Bridge Reaches The Design Stage

A contract for engineering designs for the $12-million Louisville-New Albany toll bridge has been signed by Indiana officials and sent to Kentucky for approval.

The contract—awarded Hazelet & Erdal, of Chicago, Cincinnati and Louisville—already has been approved by the U. S. Bureau of Public Roads. The Bureau will assist Indiana and Kentucky in building the span.

The bridge will be located just downstream from the privately-owned Kentucky & Indiana Terminal Railroad's toll bridge (ENR, Jan. 5, p. 33). It will be built under a plan suggested by Indiana's Gov. George N. Craig, which calls for each state to put up its own approach to the span. About half the cost of the bridge itself will be financed by revenue bonds issued by the Indiana Toll Bridge Commission. The rest of the money will come from federal road funds allocated to Indiana.

Designs are expected to be completed within six months. It is estimated that work on the structure could start early next spring and be finished in two years.

Detroit Suburbs Talk About Large Storm Drain Projects

Prompted by the worst spring flooding in the area's history, several suburbs east of Detroit are speeding plans for some $28 million worth of storm drainage projects.

• Warren Township trustees will soon let bids on the first part of a $15 million program. The Township has been threatened with a building injunction by neighboring communities for alleged critical overloading of a shared drain.

• St. Clair Shores and East Detroit last week petitioned the Wayne County Drainage Board to build $5.5 million worth of drains. Local residents have been so agitated by poor storm drainage that recent council meetings have been attended by less than 100 citizens.

• Grosse Point Woods and Harper Woods have announced a July public hearing to discuss a joint $8 million drainage project.

Wilmington Prepares Plan To Solve Parking Problem

A 10-year program to provide off-street parking facilities in downtown Wilmington, Del., has been approved by the Wilmington Parking Authority.

The authority will move ahead with the development as soon as Wilbur Smith & Associates completes field studies and analyses of traffic. Results will be issued in a comprehensive report outlining parking demands and needs from 1956 to 1966.

Under the program, off-street parking sites will be selected in various locations in the downtown area recommended by the engineers' report. Each site then will be developed as a self-liquidating project.

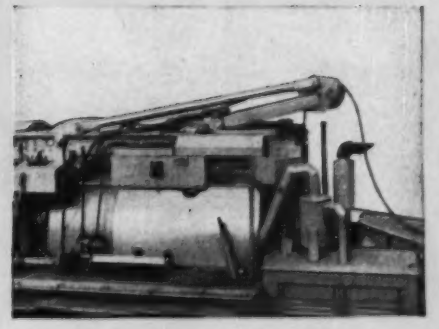
NEW HYDRAULIC MULTIFOOTE *Speeds Paving on the Indiana Turnpike*

Some of the first concrete poured into the road forms on the west end of the Indiana Turnpike was from the fast operating bucket of the new Blaw-Knox MultiFoote Paver. Other Blaw-Knox paving equipment such as the road forms, spreaders, finishers, subgraders, batch plants and older MultiFoote Pavers are helping contractors meet the November 15, 1956 opening of this new turnpike.

This newly redesigned MultiFoote Paver with hydraulic controls and faster skip operation is giving owners faster cycle time *plus a new low overall clearance height.* The new MultiFoote Paver has all the advantages of single-cable skip control with its hydraulically controlled A-Frame (see left). Hydraulic controls and faster skip operation have stepped up the high capacity of the Blaw-Knox MultiFoote Paver even more so it can put out more concrete than with any other paver!

All the features that have made MultiFoote Pavers the leaders in their field have been retained or improved. The efficient double-cone drum is always balanced—*whether it is loaded or empty.* Simplicity of design provides the easiest possible access for service or maintenance. Shovel-type crawlers with their self-cleaning action provide the longest life, best flotation and positive traction. High operator's platform provides an unobstructed view of skip and bucket at all times.

If you are bidding on any paving job, see your Blaw-Knox distributor for complete details on the New Blaw-Knox MultiFoote and other paving equipment.



The A-Frame is raised and lowered by a fast acting hydraulic cylinder. In the down position, as shown above, the overall height is instantly reduced to clear bridges or overpasses. This hydraulic control allows the MultiFoote to retain all the advantages of single cable operation.

50th Anniversary BLAW-KNOX 1906-1956

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Construction Equipment Division

41 Charleston Ave., Mattoon, Illinois

You play safe when you lay

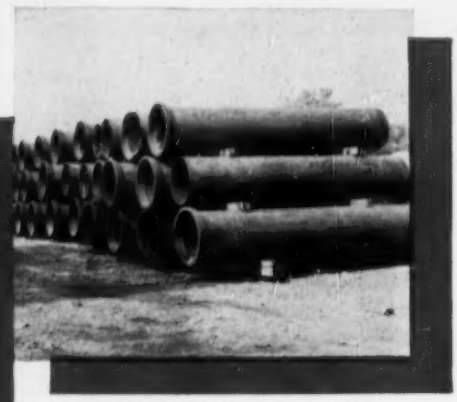
River crossing of cast iron pipe line to carry sewage to disposal plant at Portland, Oregon.

Installation of mechanical joint cast iron pipe for gas distribution at Syracuse, Nebraska.

Cast Iron pipe has long been recognized throughout the engineering profession as a rugged and adaptable material with proved ability to survive beam, compressive and shock stresses. Today's *modernized* cast iron pipe—centrifugally cast—is even tougher, stronger and more uniform in quality. Its effective resistance to corrosion, plus high strength factors, ensure long life with minimum maintenance cost. Yes, you play safe when you lay cast iron pipe—from your own standpoint and that of the taxpayers you serve. For further information, write Cast Iron Pipe Research Association, Thomas F. Wolfe, Managing Director, 122 So. Michigan Avenue, Chicago 3, Illinois.

CAST Q IRON

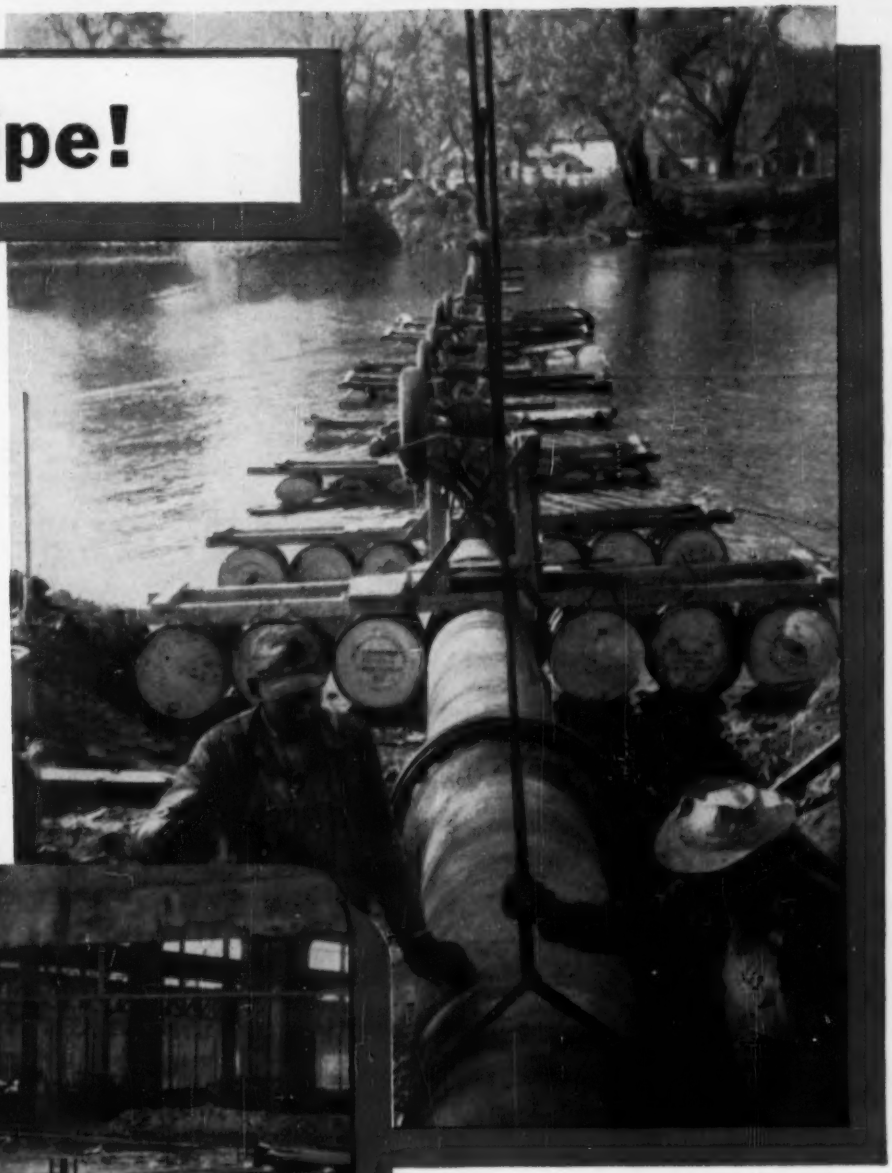
The Q-Check stencilled on pipe is the Registered Service Mark of the Cast Iron Pipe Research Association.



About a half-mile of 49-year-old 24" cast iron pipe dug up, cleaned and re-laid by Cincinnati, Ohio, Water Department.

CAST IRON PIPE

this pipe!

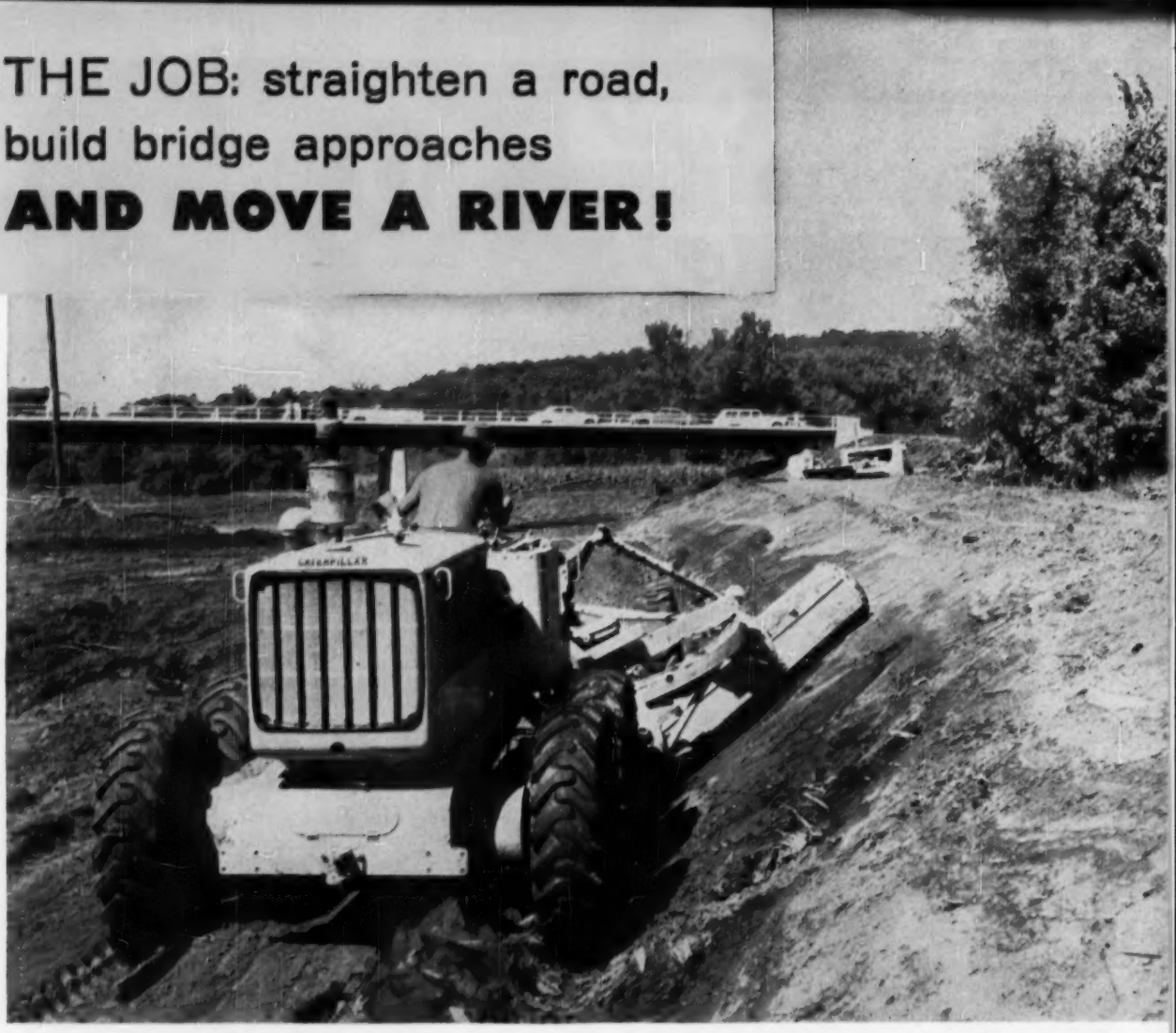


Flexible joint cast iron pipe being installed across Cedar River at Cedar Rapids, Iowa.

Cast iron pipe for large automobile assembly plant in New Jersey.

SERVES FOR CENTURIES...

THE JOB: straighten a road, build bridge approaches **AND MOVE A RIVER!**



This CAT* No. 12 Motor Grader is helping cut out a new channel for the Iowa River near Marshalltown.

It's part of a project which called for straightening curves in a county road, building approaches to a bridge, and diverting a meandering river beneath its new span. The length of road involved was only 0.8 of a mile, but Mickle and Ross Construction Co., of Newton, Iowa, moved nearly 100,000 cu. yd. of dirt.

Foreman Virgil E. Reynolds had a fleet of 11 Caterpillar machines on the job. "We don't have an off-breed in the outfit," he said.

Working close to water like this is tough going. The No. 12 had to maneuver in mushy, sandy loam. "Occasionally machines hit silt pockets and nearly dropped out of sight," Supt. Reynolds said, "but I never worry when I've got the right equipment... and I've got the right equipment."

The No. 12 is "the right equipment" for contractors all over the country—for four big reasons. Costs less to maintain. Costs less to operate. Produces more. Lasts longer.

Your dealer would like a chance to back up each one of these claims with specific details. The exclusive Caterpillar oil clutch, for instance, that gives up to 1500 hours' service without adjustment. And the new tubeless tires (now standard equipment) that can eliminate 80% of the down time caused by tires.

Let your Caterpillar Dealer demonstrate the dozens of other features that make the No. 12 the high-producing, cost-cutting motor grader it is.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR*

*Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

99% OF ALL CAT MOTOR GRADERS EVER BUILT ARE STILL ON THE JOB

Hudson River Span

Superstructure bids taken early to allow for steel

New York State will open bids June 28 for superstructure work on a $20 million bridge across the Hudson River that will connect the planned Berkshire Thruway and Massachusetts Turnpike with the main stem of the state Thruway on the west side of the broad stream.

Superstructure on the 1.05 mi long bridge is expected to cost more than $8.9 million. Bids are being called in advance of a call on the substructure to give the successful bidder time to order about 13,000 tons of steel. Plans for the substructure are expected to be ready for bidding by July or early August, according to John W. Johnson, state superintendent of Public Works.

The new bridge, to span the stream between the villages of Selkirk and Castleton, about 10 mi south of Albany, will be the seventh major vehicular structure across the Hudson between New York City and Albany, and the second crossing for the Thruway system. The first is the three-mile-long Tappan Zee Bridge, opened Dec. 15, 1955. The new bridge will form a link in the 24-mi Berkshire Thruway that will connect with the Massachusetts Turnpike at the state line near West Stockbridge, Mass.

When completed, the new bridge and its approaches will carry two 25-ft concrete traffic arteries—two lanes in each direction—separated by a 13-ft center mall.

The three-span continuous truss main section will have a 600-ft long, fixed-type center span with a minimum channel clearance of 135 ft. Flanking the center span will be two 420-ft continuous truss spans. Stringer approach spans will make up approaches on each side.

City Engineering Department Pay Scale to Be Looked Into

Acting City Manager Clarence W. Greenwald of Niagara Falls, N. Y., has been directed to arrange for a study of the city's Engineering Department with a view to determining whether it should be enlarged and whether its pay scale is sufficient to attract competent engineering personnel.

The study was approved at a City Council meeting, on a motion by Councilman Anthony C. Sabatine after the councilman was advised that the city has paid a total of $545,463.78 for outside engineering services since 1949. Mr. Sabatine had requested a report on this specific expenditure.

According to the report, the city also will pay a percentage of the cost of the current projects to a number of outside architects and engineers.

Local Views to Be Asked on Columbia Basin Development

The North Pacific Division of the Corps of Engineers has scheduled five public hearings in key Pacific Northwest cities to obtain local views about future planning of any comprehensive program for the Columbia River Basin.

The sessions, to be held next month, are related to the Corps' review of Report 308, which is itself a post-war review of an earlier Corps program for flood control, navigation, hydroelectric power, irrigation and other water resources developments.

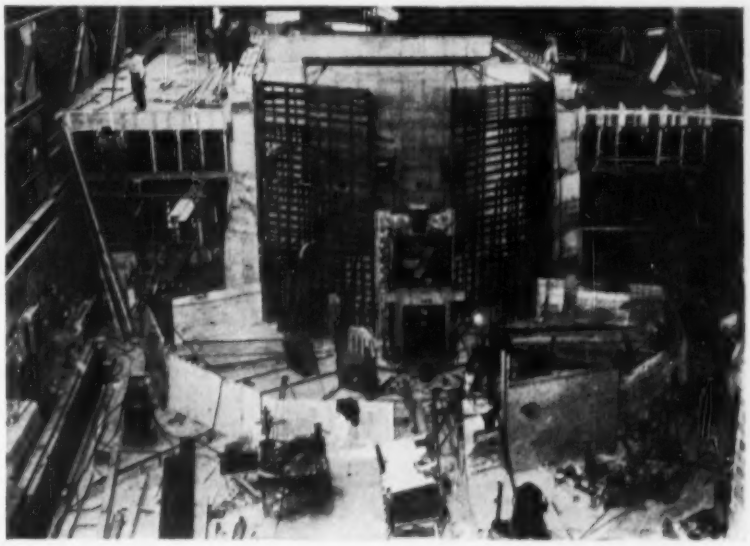
Brig. Gen. L. H. Foote, North Pacific Engineer, noted the review was started last September in collaboration with other federal agencies and the various interested state agencies. The series will begin in Missoula, Mont., July 9; move to Spokane, Wash., July 10; Lewiston, Idaho, July 11; Boise, Idaho, July 12 and Portland, July 12.

Sanitary Engineers Will Be Hired to Combat Mosquitoes

North Carolina has just announced allocation of $57,400 from its contingency and emergency fund and plans for the appointment of three sanitary engineers. The engineers will be employed for a five-month period to combat an invasion of salt marsh mosquitoes on the coastal region.

The situation in North Carolina is due in large part to a series of hurricanes which hit the state in 1954 and 1955, washing salt water over wide areas, and clogging drainage ditches and streams.

Gov. Hodges said that $25,000 of the total will be used to match local funds on a 50-50 basis for insecticides and other supplies necessary for spraying the mosquitoes. Another $12,000 will be used to pay the salaries of three sanitary engineers for five months while they work at the job. And the remaining $25,000 will permit a Salt Marsh Mosquito Study Commission set up by the 1955 state legislature to continue its operations and make recommendations to the legislature when it convenes again in regular session next January.



Reactor Shielding Has Unique Design

Swimming pool reactor under construction for the Navy Research Lab in Washington, D. C. is for research purposes, not for power. Pool being cast in concrete will be filled with water in which will be suspended the reactor core of uranium 235.

Shielding at near end of pool is to be of unique design; it will allow neutron beams to pour through porthole for use in experimental work. The pool is to be divided in two by a large water lock so that operations can be performed in one half while the other is drained.

The reactor, control system, and core are designed and being built by the NRL itself at a cost of about $296,000. Blake Construction Co., Washington, D. C. is building the pool and other construction modifications (it is at an existing facility) at a cost of about $700,000.

TISHMAN BUILDING TEAM DEVELOPS NEW

EDGARDO CONTINI
Victor Gruen & Associates

Chief Engineer Contini says: "The Tufcor alternate was selected by the contractor over a conventional forming system, and we're certainly pleased with the way it came through. Instead of conventional forms for casting the building's 13 concrete slab floors, Tufcor was used. The result was a much cleaner job without a lot of shoring. And as we expected, valuable construction time was saved."

H. B. RIGHTMIRE
C. L. Peck Construction & Realty Co.

Project Manager Rightmire says: "Tufcor saved us two months over conventional forming systems. We had no delays for form stripping, and subtrades worked on the deck below when the deck above was laid. Placing the pre-cut, job-sized Tufcor sheets was a fast, easy operation. Special anchorages were provided because of seismic conditions. Our savings and speed with Tufcor were far better than we're able to get with conventional forming."

G. W. BAUER
C. L. Peck Construction & Realty Co.

Job Superintendent Bauer says: "We measured Tufcor against our experience with conventional forming every step of the way. Tufcor saved us quite a bit of clean-up time because there was so little leakage of wet concrete. And on concreting, Tufcor saved at least 60 days. We poured two floors one week, three the next—a floor every other day. We were able to organize crews so much better with no stripping to do and no uneven demands for labor."

IN LOS ANGELES:

New use of TUFCOR® saves two months construction time on new Tishman project

Replacing customary forming for concrete floor slabs, TUFCOR stays in place, eliminates removal of forms, speeds up concreting to a rate of one full floor every other day

If you've always thought of Granco's Tufcor *only* in terms of strong, fire-safe roof construction, the Tishman Building team's experience proves the profitable use of this tough-tempered, deep-corrugated steel form for floor slabs with spans up to 7 ft.

This noted team of designers and builders used 230,000 sq. ft. of uncoated 24-gage Tufcor as permanent, stay-in-place floor forms. Typical span was 6'8" with a 3¾" lightweight structural concrete slab. The tough-tempered, corrugated Tufcor sheets gave the finished slab high strength and safety well beyond ordinary requirements.

Tufcor out-performed conventional forming methods right down the line. Pre-cut Tufcor was easy to handle and went in faster, provided an immediate working deck for all trades, eliminated form stripping, reduced planking and shoring. Concrete placing was completed in an amazingly short time. *Over all, Tufcor keyed a 60-day faster construction schedule!*

Tufcor-formed floors may well be an equally profitable specification in many of your own projects. For complete information, estimates or costs on your building plan, consult Granco home or district office, Attention Dept. E-63; or, see our listing in Sweet's Catalogue.

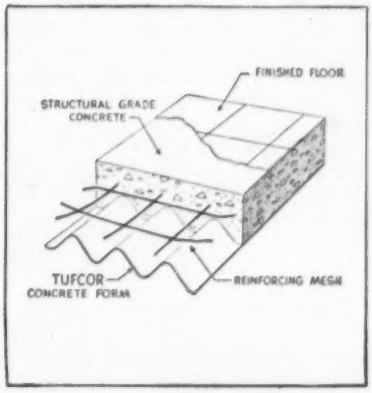
USE OF TUFCOR, PRAISES ITS PERFORMANCE!

M. WEINGARTEN
Tishman Realty & Construction Co.

Builder's Representative Weingarten says: "Time means money on a construction job like this. The fact that Tufcor doesn't have to be removed once it's placed saved us a lot of time. It was only one of several ways Tufcor helped us keep costs down. Equally important, we'll start realizing tenant revenue earlier because of earlier completion of the building."

The minute it's placed, Tufcor creates a safe, strong work platform.

How Tufcor formed floors in Tishman Building. Slab reinforced by wire mesh.



NOW UNDER CONSTRUCTION, the modern, new 13-story Tishman Building at 3325 Wilshire Boulevard in Los Angeles. *Architects-Engineers:* Victor Gruen & Associates, Los Angeles, California. *Owner:* Tishman Realty & Construction Co., New York, N.Y. *Contractor:* C. L. Peck Construction & Realty Co., Los Angeles, California.

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A $200-million effort to untangle New Orleans' traffic hinges on a $65-million river crossing

New Bridge Keys New Orleans

During the last forty years the mighty Mississippi has grown rather accustomed to engineers and construction men taking considerable liberties with him as he moves on his way to the Gulf. They've subjected the "Father of Waters" to being dammed, bridged, dredged, leveed, rivetted, shortened with cutoffs and harnessed for power.

Latest and one of the boldest ventures in this long list of construction facts is the cantilever highway toll bridge being built near the foot of Thalia Street, in New Orleans.

• **Ahead of schedule**—For the past year (groundbreaking was on March 25 of last year) construction has been centered on the four main piers supporting the cantilever and anchor spans. By April 1 of this year, they were nearly three-fourths completed, dollarwise. Pier I was entirely completed, and the caisson for Pier II had been sunk 148 ft below sea level, with only 32 ft to go. Pier III was two months ahead of schedule, with its caisson down to grade at El-148, and Pier IV was on schedule.

All four main piers are scheduled to be completed by December of this year. Erection of the cantilever and anchor spans will start late this year. And by January, 1958, the bridge should be carrying toll traffic between New Orleans and its suburban neighbors Gretna and Algiers, on the West Bank of the river—six months ahead of the original completion date.

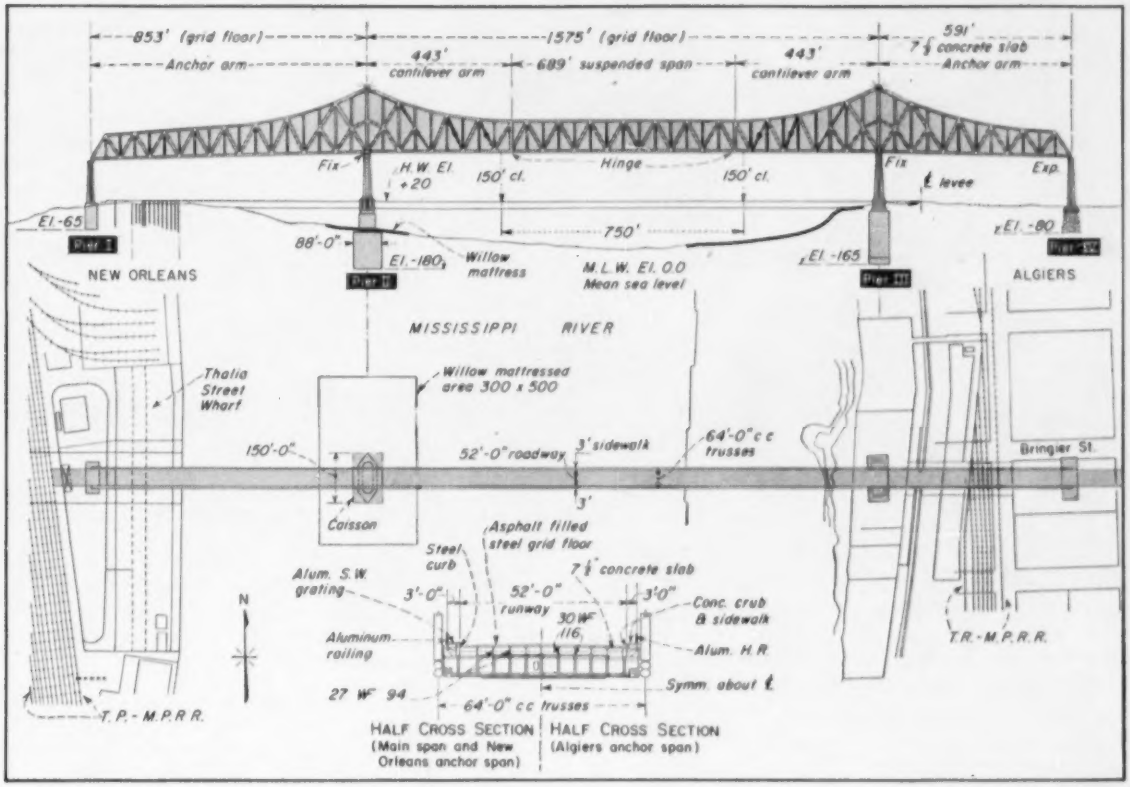
The 2.3-mi structure, including approaches, is being built by the Mississippi River Bridge Authority, under a $65 million bond issue. It is destined to rank high in importance in the annals of major bridge projects on several points. For example:

• **Third longest**—With its 1,575-ft cantilever span and anchor arms of 853 ft and 591 ft, it will be the longest cantilevered bridge in the United States, and the third longest in the world (ENR, Oct. 21, 1954, p. 22). The completed structure will dominate New Orlean's skyline. Its two main river piers (II and III) will rise 160 ft above the river, while the topmost panel points of the cantilever trusses will rise to a total height of 361 ft above mean sea level, which is also the mean low water level of the river. The deepest pier (No. II) extends 110 ft below riverbed, to El. −180. The 52-ft roadway will carry four lanes of toll traffic over the river at a maximum clear height of 150 ft above high water.

• **Renaissance in trafficways**—But more important, the completed bridge will have considerable impact on the economic and traffic pattern of the New Orleans Metropolitan Area. In effect, it forms the keystone of a $200-million bridge-and-highway construction program that constitutes a renaissance in expressway traffic for the entire area.

During the first full year of operation nearly 8,000,000 vehicles are expected to use the toll bridge, at an average one-way charge of 40 cents. Ultimately, it will handle 18,000,000 vehicles annually, according to traffic studies.

Historically, waterborne transportation has been the life blood of New Orleans, throughout its economic development and industrial growth up to



Design of the new Mississippi River crossing (above) takes account of difficult foundation conditions in the muck of a river delta area and heavy wind loadings.

Development

the present time. But of late it has become increasingly evident that the providing of improved facilities for handling increased volumes of street and local highway traffic is of equal if not even greater importance to the continued prosperity of the entire metropolitan area.

• **Five-point plan**—Fully cognizant of the need for a comprehensive and integrated highway system that would funnel traffic into and through the city, state and local agencies evolved a five-point construction program designed to cost about $200 million (ENR June 16, 1955, p. 49).

In addition to the $65 million toll bridge over the Mississippi at New Orleans, it includes: a $53 million, 24.3-mi concrete causeway across Lake Pontchartrain, also now under construction; a $33 million expressway link between the causeway and the river bridge; a $9 million expressway along the West bank of the river to connect with the Huey Long Bridge, 10 miles upstream; and about $40 million worth of street and highway construction improvements along the expressway route to provide relief for heavily congested areas.

• **Main river piers**—From a construction standpoint the four main river piers supporting the cantilever span and anchor arms, presented the greatest variety of tricky problems. They are being built by the Dravo Corporation, under a $6.7 million contract, awarded in January of last year (ENR, Feb. 3, 1955, p. 27). B. N. Parker is general superintendent.

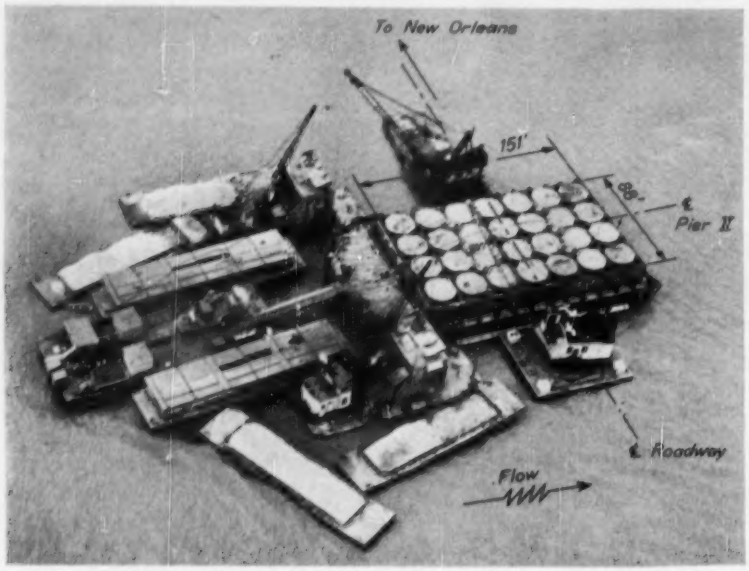
Of the four main piers, the biggest one is Pier II, 550 ft offshore from the East Bank of the river at the junction of the 1,574-ft cantilever span and the 853-ft anchor arm. The East Bank is actually on the west side of the river, since it loops around and flows almost due north at the bridge site. Similarly, the West Bank which is on the far side from New Orleans is actually on the east side of the river at this point.

Pier II will have a total height of about 342 ft. It will be founded in stiff hard clay 180 ft below mean sea level. The upper 132 ft will be twin reinforced concrete shafts 64-ft c-c capped and strutted at about mid-height with reinforced concrete beams.

The next 35 ft of pier is mass concrete, of which the upper 30 ft is faced with stone. Then comes a reinforced concrete distributing block 104 ft long, 41 ft wide and 10 ft thick to distribute the pier and bridge loads to the cellular cassion at El. —15. The cassion extends on down to El. —180. The top 57 ft extending down to riverbed is 45 ft wide. The next 88 ft of open-dredged termie-sealed floating caisson measures 88 ft wide by 151 ft long. And finally, the last 20 ft is a concrete seal.

To sink this huge steel and reinforced concrete caisson, the contractor first floated in a 300x500-ft willow mattress, ballasted it and sank it on the riverbed at the pier site, to prevent scour. Next, a huge U-shaped prefabricated steel mooring stall, supported on 150-ft-long steel piles driven into the riverbed, was positioned around three sides of the pier site to control the floating caisson while it was sunk to the riverbed. A half-circle of steel sheet piling was driven around the upstream end of the

. . . Bridge piers and cantilever span



MARINE EQUIPMENT for sinking Pier II cofferdam 180 ft below river level includes: Two floating concrete plants; two cement barges; four aggregate barges; one electric power and storage barge; and two derrickboats with fully-revolving cranes for placing cofferdam concrete and for clamshell dredging through the 28 dredging wells.

stall to protect it from the current and floating debris.

• **Huge caisson**—The floating base of the caisson measuring 151 ft long, 88 ft wide and 20 ft high was fabricated at Dravo's Neville Island plant near Pittsburgh, Pa., and towed 1,900 miles down the Ohio and Mississippi to New Orleans. It was fabricated watertight and contained 28 dredging wells of 18-ft dia. It also carried a heavily reinforced steel cutting edge. It was named "Highpockets" (ENR, Aug. 25, 1955, p. 24) after one of Dravo's former vice presidents who carried that nickname.

Sinking the huge caisson began last October 15 and a month later it had been firmly landed on the riverbed in 70 ft of water. Additional tubular sections were added to the 28 dredging wells as the sinking progressed, with concrete being added as necessary inside of steel cofferdams surrounding the dredging wells.

In sinking the 151x88-ft caisson on down 110 ft below streambed, additional concrete was added while two floating clamshell dredges removed the clay and sand through the 18-ft-dia dredging wells.

• **Floating concrete plants**—Two floating concrete plants anchored alongside, serve the caisson-sinking operations. Together, they have a capacity of 160 cu yd of concrete per hour. The concrete plants are serviced by cement barges, and barges loaded with sand and gravel. Sand and gravel is handled from barges to concrete boats by a clamshell derrick on each boat. The dredging and concrete placement are handled by two 50-ton derrickboats, with 175-ft booms.

• **Other piers**—The completed anchor pier on the New Orleans side of the river (Pier I) set 300 ft behind the waterline at the Thalia St. wharf. It is an open-dredged caisson 91 ft long, 38 ft wide and 71 ft high, with an 8-ft-thick distributing block supporting twin reinforced concrete shafts 125 ft high.

Pier III on the West Bank of the river, in front of the levee, is an open-dredged concrete caisson 157 ft high, including a 20-ft seal, 135 ft long by 61 ft wide. A 10-ft-thick distributing block on top of the caisson supports 28 ft of mass concrete base which, in turn, supports twin reinforced concrete shafts 131 ft high. Pier IV, which is the other anchor pier, is made up of twin concrete shafts 141 ft high. They are supported on a 10-ft-thick footing 122 ft long by 48 ft wide. This footing is carried on 490-ft timber piles 80 ft long. The piles are spaced 3 ft 6 in. each way and are designed for a maximum load (dead load plus 50-lb wind load) of 22.1 tons each.

Quantities alone are no yardstick of the magnitude of construction, but some of the total quantities in the four main piers run into rather interesting figures. For example, there will be an estimated 141,000 cu yd of concrete in the four piers, of which 63,000 cu yd will be in the caisson of Pier II. Reinforcing steel will total 1,900,000 lb; and structural metal work and anchor bolts, 656,000 lb.

• **Cantilever span**—A $12.2 million contract was awarded the Bethlehem Steel Co. on Sept. 27 of last year, for furnishing and erecting the main superstructure (ENR, Oct. 13, 1955, p. 25). This includes the 1,575-ft cantilever span between Piers II and III; the 853-ft anchor arm from Pier I to Pier II; and the 591-ft anchor arm between Piers III and IV. The 1,575-ft central span is made up of two 443-ft cantilever arms supporting a 689-ft suspended span.

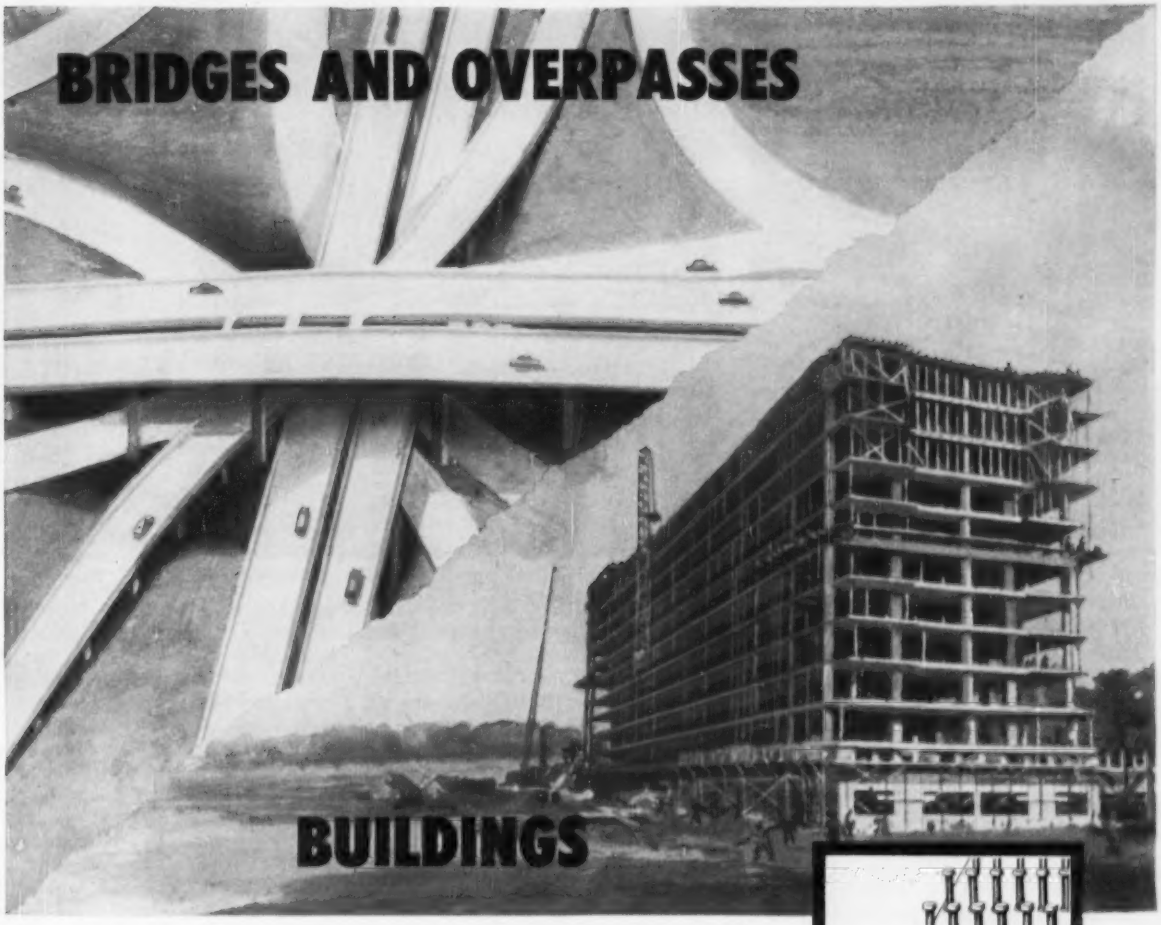
Principal quantities include 16,200 tons of fabricated steel; 900 tons of eyebars; 1,400 tons of grid flooring; 30 tons of aluminum grating; 6,000 lin ft of handrail; 216,000 lb of reinforcing steel; and 820 cu yd of concrete. Contract time for completion is 820 calendar days which means that the cantilever span and its two anchor spans should be completed by December 1957.

• **60 years of planning**—Modjeski and Masters, consultants in charge of design and construction of the $65 million toll bridge project, weren't the first to tackle the tricky problem of bridging the Mississippi at New Orleans. There have been a number of plans proposed during the past 60 years.

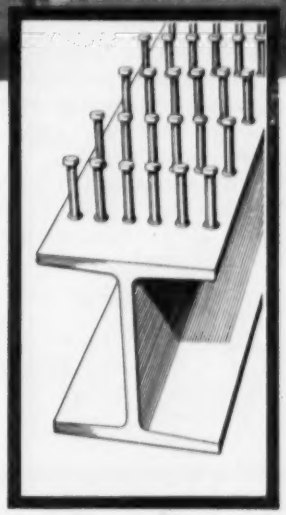
As early as 1892 the Southern Pacific Railway proposed the construction of a 1,000-ft single-span, high-level cantilever bridge, using designs made by E. L. Corthell and E. H. Connors. But, according to historians, there was a depression that year which prevented the financing of the proposed bridge.

Various types of crossings were proposed from time to time. They included several plans for low-level bridges of various span lengths; a low-level bridge with movable spans; a single-track railroad tunnel; cantilever bridges of various lengths; and a suspension bridge. However, a detailed study of a suspension bridge of 1,800-ft main span, with loaded side spans, proved that type of structure to be unacceptable, largely due to excessive settlement of the supporting piers in the yielding foundation materials. Moreover, since New Orleans lies in the hurricane belt, extensive aerodynamic studies would have been required as part of the suspension bridge design.

• **Superstructure design**—The final designs covering the bridge now under construction near the foot of Thalia St. call for a 52-ft roadway. This



OF COMPOSITE DESIGN
CONSTRUCTED WITH
STUD WELDED
SHEAR CONNECTORS



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PLACING CONCRETE in the 135x61-ft caisson shoe of Pier III. Floodlights on bank permitted around-the-clock operations.

allows for four lanes at present and permits a future five-lane roadway for peak-hour traffic in either direction. There will also be a 3-ft-wide refuge sidewalk along each side.

With an 853-ft anchor arm on the New Orleans side of the river—long enough to clear the Thalia St. Wharf—and a 591-ft anchor arm on the Algiers side, additional weight was needed in the latter to counterbalance the cantilevered section. Consequently its 52-ft roadway is reinforced concrete, 7.5 in. thick, supported on 11 lines of 30-in., 116-lb wide-flange stringers.

The other two main spans—the 853-ft anchor arm and the 1,575-ft central span made up of a 689-ft central suspended span between two 443-ft cantilever arms—carry lightweight roadway and sidewalks. The 52-ft roadway is a steel grid, filled and surfaced with bituminous material to a total depth of 6.5 in. It is carried on 13 lines of 16-in., 36-lb wide-flange stringers. Aluminum grating 1.5 in. thick forms the 3-ft refuge sidewalks on both spans.

Handrails for the entire bridge including approach spans will be aluminum. They will be made up of a 5-in. pipe rail at the top, and a 4-in. channel about 9 in. above the sidewalk, joined together with 1.5-in. pipe balusters at 6-in. c-c; supported by 5-in. H-beam posts.

• **Design criteria**—In general, the AASHO 1953 Standard Specifications for Highway Bridges were used, except for certain modifications. For the main cantilever span of 1,575 ft, permissible unit design stresses were somewhat higher than normally used in short-span bridges. For example, a basic unit stress of 20,000 psi was used for A7 structural steel, although it was required to have a minimum yield point of 36,000 psi.

In order to reduce weight, a high-strength steel was used where advantageous in truss members. Its specified minimum yield point was 50,000 psi, for a basic design tensile stress of 30,000 psi.

Since New Orleans gets buffeted by hurricane winds of the order of 110 mph, the bridge was designed for a wind load of 70 lb per sq ft, with permissible unit stresses of 40% above basic, in combination with dead load.

• **Design loads**—In designing the main cantilever superstructure between Piers I and IV, the dead load included 200 lb per lin ft of bridge for utilities. The 52-ft-wide asphaltic-concrete surfaced steel grid roadway between Piers I and III was assumed to weigh 47 psf, with a 7½-in. reinforced concrete roadway slab being used between Piers III and IV.

The live-load was four lanes of H20-S16 truck or lane loading, plus impact as per the AASHO specifications. Live load on the 3-ft refuge sidewalk was assumed to be 100 lb per lin ft of truss. Several combinations of wind loadings with dead and live load were used, with a maximum of 70 psf or 1¼ times the vertical projection of the structure. A longitudinal force of 5% of the live load in all lanes carrying traffic headed in the same direction was included in the designs. And for erection stresses a load of 500 lb per lin ft of bridge was used in addition to the dead load of trusses, bracing, floor beams,

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The Pioneer Construction Co. was formed in January, 1955. Its growth reflects the wide experience and sound policies of the key men. They believe it takes the best of modern equipment, efficiently operated and properly maintained, to stay in business in contracting. Their experience with two Bucyrus-Erie 38-B's, one rigged as a dragline and the other as a shovel, has proved out this policy. These machines offer good production ability, and they are operated and maintained in a manner to provide economical performance.

Let your Bucyrus-Erie distributor give you complete details on these modern excavators — ⅜ to 4 cu. yd. — and show you how they can help bring top efficiency to your operations.

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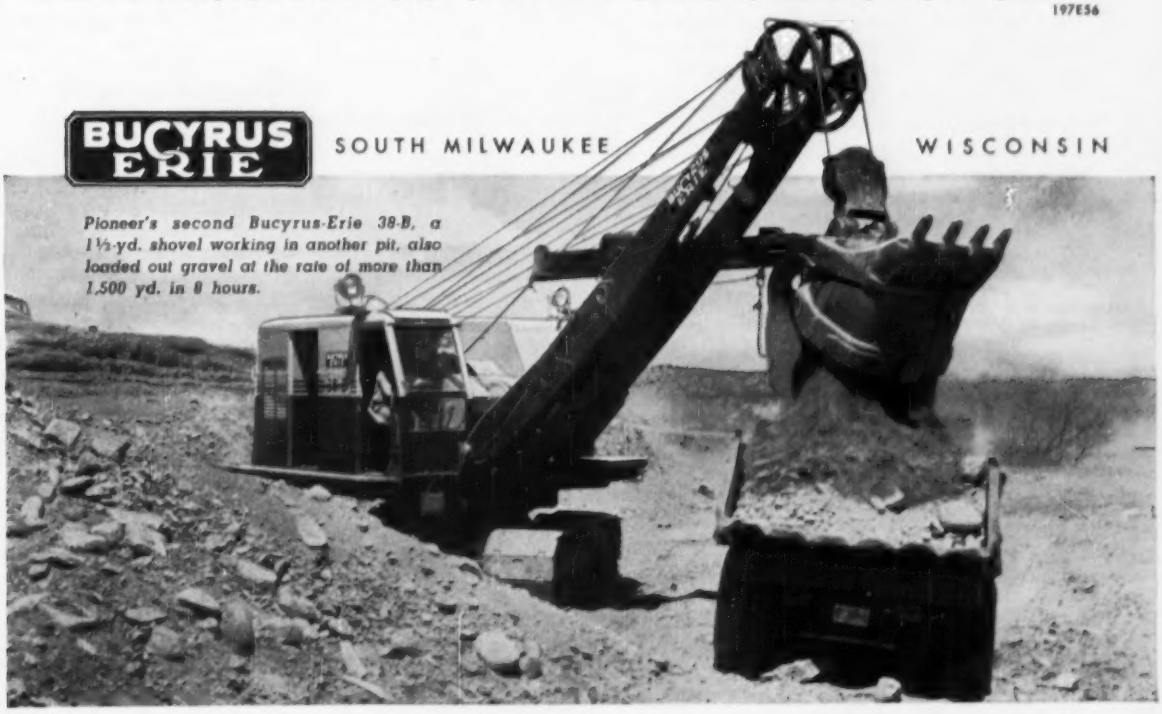
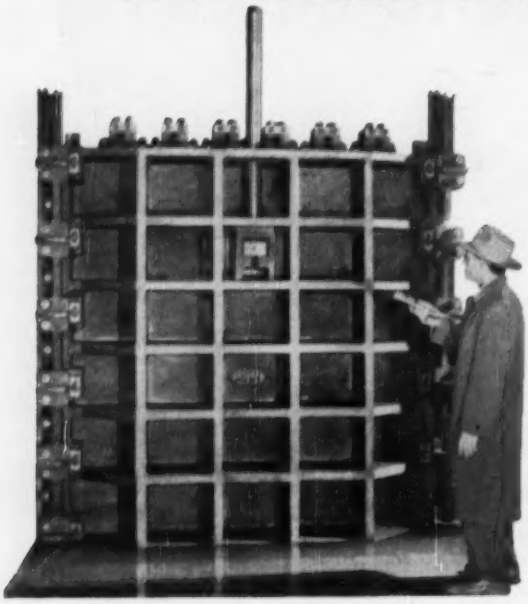


Pioneer's second Bucyrus-Erie 38-B, a 1½-yd. shovel working in another pit, also loaded out gravel at the rate of more than 1,500 yd. in 8 hours.

FOR GENERATIONS TO COME!



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stringers, etc. For cantilever erection the weight of the traveler was assumed to be 170 tons.

• **Truss dimensions**—Two lengths of panel are used for the cantilever span and anchor arms. The first 10 panels of the 853-ft anchor span between Piers I and II will be 45 ft 11⅛ in. The remaining 8 panels of that span, all 32 panels in the main span between Piers II and III, and the 12 panels of the 591-ft anchor span from Pier III to Pier IV all will be 49 ft 2¾ in.

Trusses are spaced 64 ft c-c. The depth of trusses between working lines of top and bottom chords vary from 70 ft over Piers I and IV, to 95 ft over Piers II and III.

• **Heavy stresses**—As would be expected in a cantilever the size of this one, some of the main members carry rather heavy stresses. For example: Maximum top-chord tensile stress under dead load, live load plus impact, and sidewalk load over the main Piers II and III is 10,515 kip (10,515,000 lb.). It is carried by 12 high-strength 15.5x2-in. eyebars on 13.25-in.-dia pins. Maximum bottom-chord stress under the same loading is 8,942 kip, compression. It also occurs at Piers II and III, and calls for a double-box member made up of: 8 plates 48x¾ in., 4 plates 7x¼ in.; 8 angles 8x8x¾ in.; 2 web plates 30x¾ in.; and two cover plates 30x¾ in. The cover plates will be fabricated with 12x18 in. ovaloid perforations at 3-ft-6-in. centers.

• **Other contracts**—In addition to Dravo's $6.7 million contract for the four main piers, and Bethlehem's $12.3 million contract for the cantilever superstructure, two other major contracts are under way.

Bethlehem Steel Co. holds a $4 million contract for furnishing and erecting five deck-truss spans totaling 1,420 ft on the New Orleans side and three spans totaling 780 ft on the other side. Broh Bros. Construction Co., New Orleans, is building the 8 piers to support these deck trusses, under a $2.5 million contract.

Remaining contract work includes approach substructure and superstructure on the New Orleans side as far as Camp St., and on the Algiers side to the West Bank Interchange. It also includes the toll plaza on the west bank, roadway lighting and miscellaneous construction.

Neville Levy is chairman of the Mississippi River Bridge Authority, Frank X. Armiger is administrator, and Charles E. Cassagne, Jr. is chief engineer. For Modjeski and Masters, consulting engineers and designers of the $65 million project, Otto F. Sorgenfrei is project engineer.

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Architect: Walter E. Schardt, Pittsburgh, Penna.
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Both schools constructed under the Municipal Authority of the School District of Monroeville, Allegheny Co., Pennsylvania.

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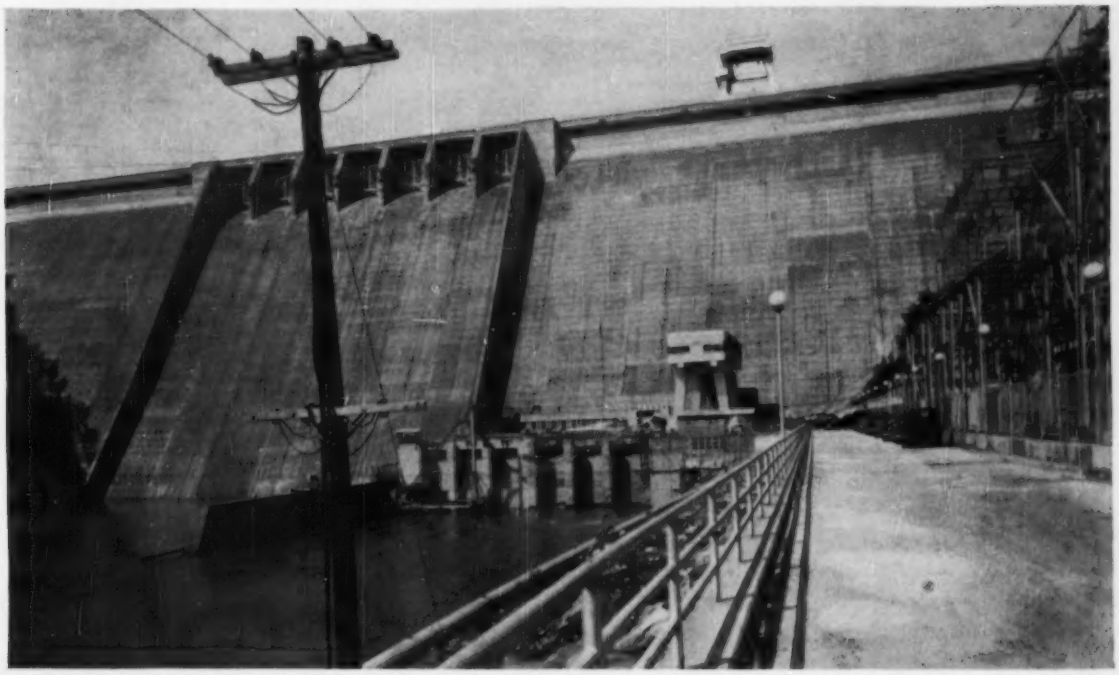
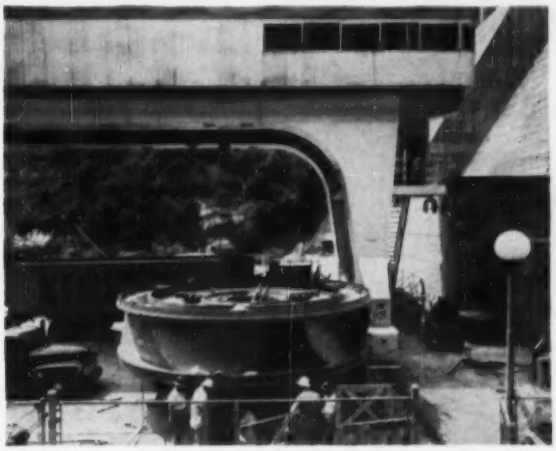
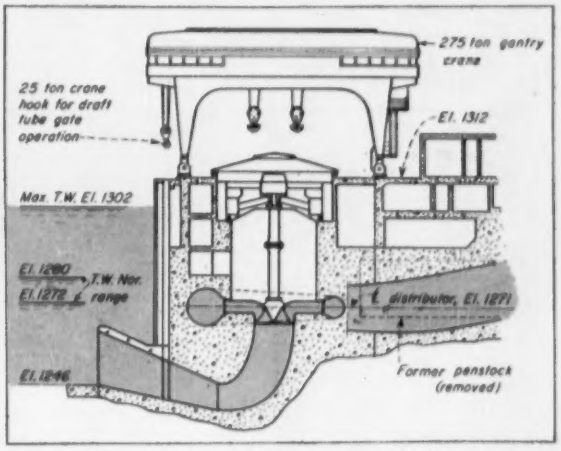


HIWASSEE DAM reversible unit is in the powerhouse section next to the training wall. At peak demand, it is an 80,000-hp turbine. During low-demand night hours, unit becomes a 102,000-hp pump.





RUNNER for the big pump-turbine can put 3,900 cfs (1,750,000 gpm) back into Hiwassee Reservoir against a 205-ft head. As turbine, unit uses 4,250 cfs at 190-ft head. At right is section through the reversible unit.

TVA Installs Largest Pump-Turbine

The world's largest pump-turbine was put into service recently at Hiwassee River in North Carolina to add peak generating capacity to the power system of the Tennessee Valley Authority. During times of peak demand, this unit will be operated as a hydroelectric generator to add 59,500 kw to the capacity of the TVA system. During night hours when the demand on the system is low, the same unit, drawing off-peak power from other plants of the system, will be used as a pump to draw water from the reservoir below Hiwassee Dam and pump it back into the Hiwassee Reservoir for reuse in meeting the peak load of the following day.

This pumped-storage method for improving the operating characteristics of a power system is not new. It has been used for many years in Europe and is employed on a few systems in the U. S. and in South America. The novelty of the new Hiwassee unit is its record size. It consists of a 102,000-hp pump driven by a 70,000-kva motor, which, when reversed, becomes an 80,000 hp turbine driving a 59,500-kw generator. When operating as a turbine, the new unit uses 4,250 cfs at 190-ft head; when operating as a pump, it can move 3,900 cfs against a head of 205 ft.

Hiwassee Dam is one of several on the Hiwassee River. It forms a reservoir of 307,000-acre-ft capacity. Immediately below it is the reservoir

Gain in Power Output Due to Pump-Turbine Unit

Period of year	Millions of kilowatt-hours: Present unit	Units 1 and 2	Increase
November-April			
On-peak	135	184	49
Off-peak	146	125	—21
Sub-total	**281**	**309**	**28**
April-November			
Unclassified	451	452	1
Total	**732**	**761**	**29**

formed by Apalachia Dam, ten miles downstream.

When Hiwassee Dam was built in the period 1937-40, one generating unit of 57,600 kw capacity was installed in a semi-outdoor type of powerhouse, and provisions were made for a second unit of similar size. This included construction of the intake structure and the penstock tube, also excavation for the draft tube. The tailrace area was closed off by a rockfill cofferdam to facilitate construction of the second unit.

Construction of a pump-turbine unit instead of a conventional unit in that area was begun in January 1954. The change in type of unit called for some deepening of the draft-tube area, a small amount of additional rock excavation elsewhere, and minor changes in the penstock terminal section.

The new unit is set at a level that will permit drawing 8,700 acre-ft from the reservoir behind Apalachia Dam when the unit is operating as a pump.

• **Typical operation**—The pumping operation at Hiwassee Dam will be employed only when system peak loads are such that the rate of reservoir drawdown would be too great to continue operating without additional water supply to restore the operating head. Usually this will be between late November and early April when the operating head is low due to flood-storage reservations.

When the pump-turbine cycle is in effect, generating is stopped at Hiwassee as the system daytime peak load falls off. Then pumping is begun. This reversal of the pump-turbine unit is begun with closure of the wicket gate. Water in the draft tube is then depressed by air pressure to below the pump-turbine wheel, the generator becomes a motor with reversal of rotation and, when up to speed, the draft tube is again flooded and the wicket gate opened to start the pumping operation.

Power for this operation is taken from the system network (Hiwassee not generating) during the system off-peak night hours. Hiwassee Reservoir is thus supplied with water pumped from the lower pool (Apalachia Reservoir), drawing that pool down, raising the Hiwassee pool level and consequently increasing the operating head. With the rising demand for power the next morning, pumping is stopped and the pump-motor reversed to make it again a turbine-generator. One or both units can then be operated to produce electric power on the system peak loads.

The pump-turbine and motor-generator had a combined cost of $2,611,555, which is believed to be about 20% more than the cost of a conventional hydroelectric generator. Total cost of the new work, including extension of the powerhouse and switchyard, will be around $6.1 million when the work is completed.

• **Economic advantages**—The additional 20% that was spent to provide a pump-turbine unit is expected to be more than offset by the economic gains it will bring to the system as a whole. Addition of the new unit will increase the rated capacity of the plant by 59,500 kw and its dependable capacity by 55,500 kw. Also, the pump-turbine unit will provide 8,500 kw more dependable capacity during the winter period, when maximum load occurs on the TVA system, than would be available with a conventional two-unit installation.

Near the end of the winter period, the additional capacity provided by a pump-turbine unit could amount to as much as 44,000 kw. Thus, the principal value of the second unit (pump-turbine) is the peaking capacity it can add to the system capability during this critical period. Also, during a dry year, the plant capability is increased substantially by a pump-turbine when a conventional unit would add very little.

It is estimated that the pump-turbine unit will increase the combined average annual energy at Apalachia and Hiwassee from 732,000,000 kwh to 761,000,000 kwh, or 29,000,000 kwh. Distribution of this increment is given in the accompanying table.

During an average year the benefits are estimated at $411,000 and $565,000 for the conventional and pump-turbine, respectively, less annual costs. While the pump-turbine annual costs are higher, the pump-turbine provides 8,500 kw more dependable capacity and this results in about $39,000 greater net annual benefits than would a conventional unit.

In addition, the pump-turbine will also mean less drawdown of the reservoir during the season than would a conventional one. Thus, the operating head can be held at the highest allowable level and thereby maintain the greatest possible generating capability of the two-unit plant for use on system peak loads in the period of maximum system peak demand.

The Apalachia project downstream is capable of regulating the peak discharges of a pump-turbine and the present unit with reasonable amount of reservoir fluctuation. With two conventional units installed at Hiwassee, the Apalachia Reservoir would be required to fluctuate to a greater extent. This greater fluctuation would result in water being wasted through the spillway gates and in a somewhat lower average operating head at Apalachia. Thus, the pump-turbine increases the efficiency of generating operations at Apalachia.

No adverse effect on Hiwassee River fishlife will result from operation of the pump-turbine. The same number of fish will survive when the unit runs as a pump as in a conventional turbine. In fact, there is less tendency for fish to travel into the pump intake during pumping than there is for fish to enter the penstock during turbine operation. Another feature of a pump-turbine is its lower overspeed characteristic. Runaway speed for the Hiwassee unit is about 161 rpm compared with 235 rpm for a conventional unit. This lower overspeed was considered when designing the motor-generator.

Planning, design and construction of the pump-turbine unit is under direction of C. E. Blee, chief engineer of the TVA. Planning was done by the division of water control planning under J. S. Bowman, design by the division of design under R. A. Monroe, and construction by the division of construction under G. K. Leonard. Key personnel at the project site are: H. L. Broadfoot, project manager, Hiwassee area projects; W. O. Chadwick, construction engineer; and A. C. Knoll, construction superintendent.

The Allis-Chalmers Manufacturing Co. supplied both the pump-turbine and the motor-generator.

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3 Flush lighting can be installed within the cells of Long Span Q-Deck to produce an extremely attractive, efficient, low-cost lighting system, as shown in the photograph and detail to the right. Use the coupon to write for further details on this remarkable deck — designed for multiple, money-saving benefits.

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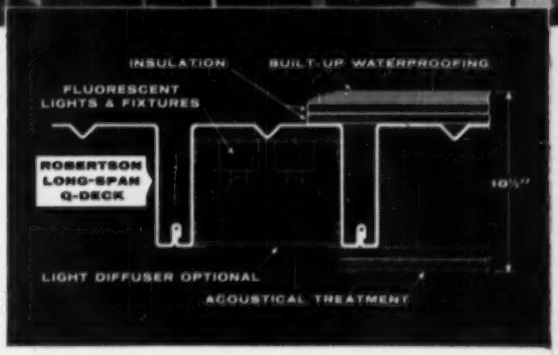

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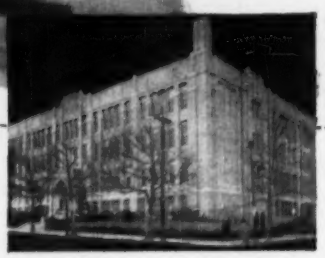

Board of Education maintenance engineers in one of the Nation's largest cities have coated this and thirty others of the school system's 300 buildings with above-grade masonry water repellent made with UNION CARBIDE Silicones. New schools are being treated as erected. In the school shown above, leaks were serious, so brick was repointed before treatment. Result: No more moisture problems.

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At Oahe Dam—

1. Batch-plant was braced and put on dollies after finishing its job at upstream end of outlet works.

2. Crawler tractor tied on to help truck pull plant at one point in 2-mi end-run around dam to new downstream site.

3. After 6-hour trip, plant was made ready for production. Moving the plant intact netted a two-week saving in downtime.

Upstream Concrete Plant Moved Downstream

A 135-ton concrete batching and mixing plant was moved bodily more than two miles at Oahe Dam near Pierre, S. D., where the world's largest rolled-earth dam is being built across the Missouri River. The plant's concrete is used in the intake and outlet structures and for tunnel lining.

The move transferred the plant from the upstream face of the dam, where it mixed 104,000 cu yd of concrete lining for the upstream half of the six outlet works tunnels, to the downstream face, where it will prepare another 125,000 cu yd for the downstream half of the tunnels and the control shafts, sunk in the axis of the dam.

Top-heaviness of the vertically elongated structure was a consideration in its moving. It stands the equivalent of seven stories in height and has a base only 24 ft square. The aggregate bins were emptied beforehand to lower the center of gravity, but no other precautions were taken to change the natural balance. Specifications required that the move be made in no more than a 10-mph wind. Although South Dakota's prairie wind whooped it up the day before and the day after the move, dead calm prevailed on the day set for the move and no waiting was occasioned by the wind restriction.

The move was made with an ease that belied the ticklishness of the operation. The plant was elevated on temporary blocking and bracing, and rubber-tired dollies were placed underneath. Although the new location of the plant is 55 ft higher than the old, a single diesel-engine truck unit was sufficient to haul it. Only in one area of soft ground was a boost from a crawler tractor necessary. The path of removal was by an end run on a haul road around the dam to save climbing

FOR REMOTE CONTROL JOBS on a great variety of CONSTRUCTION EQUIPMENT

TRU-LAY *Flexible* *PUSH*-PULLS

• Adaptability to all sorts of mechanical situations explains, in large measure, the wide-spread use of TRU-LAY PUSH-PULLS on tractors and their accessories, power shovels, winches, road graders, road oilers, dump trucks, snow plows, engine-driven pumps, rock crushers, etc.

On construction equipment these dependable Push-Pulls are used for the remote control of hydraulic and air valves, brakes, clutches, transmissions, throttles, chokes, governors, power take-offs, and on many other applications.

TRU-LAY PUSH-PULLS are precision products, not gadgets. They provide positive remote-action whether anchorages are fixed or movable . . . for light loads or loads up to 1,000 lbs. . . . and they are effective over short or long distances up to 150 feet or more.

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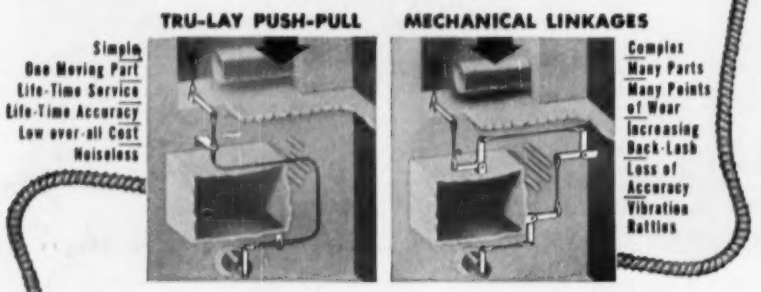
For complete information and details, write for DATA FILE.

"Solid as a rod but *flexible* as a wire rope" is a good description of TRU-LAY PUSH-PULL REMOTE CONTROLS. This flexibility makes it possible to snake around obstructions . . . permits the ideal arrangement of all control elements . . . greatly simplifies installation of controls by reducing the number of working parts . . . damps out noise and vibration. Versatile, accurate, adaptable, rugged . . . they are the ideal remote controls for construction equipment.

Advantages of Tru-Lay Push-Pull flexibility and simplicity are pictured below—



TRU-LAY *flexible* PUSH-PULLS are dependable and accurate even under the most adverse conditions. They perform effectively under extremes of heat or cold . . . from jet engine temperatures to 70° below zero F. The inner, working member (lubricated for life during assembly) is fully protected by the tough, flexible conduit. Abrasive dusts, dirt and moisture are sealed out. Fittings are cold-swaged to make them integral parts of the control unit. It is a matter of record that we have never heard of a TRU-LAY *flexible* PUSH-PULL wearing out in normal service. Use of these versatile, simple and rugged controls means the virtual elimination of maintenance.

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a steep grade. Actual moving time was about six hours.

The most striking aspect of the operation was not the physical moving itself but the gain in efficiency, said Project Manager George Lindquist. To have match-marked, disassembled, and reassembled the plant would have required at least four weeks and might have taken six, thereby interfering with the construction schedule. Bodily removal of the plant saved at least two weeks downtime in a region where the construction season is all too short anyway. The contract for removal was awarded March 22: the plant was moved and in business at the new location April 5. Part of the interval between was spent waiting for roads to firm up.

The plant is owned by Oahe Constructors. The combine is carrying out the $9.5-million contract for the Stage I Outlet Works (intake towers and upstream tunnels) and holds the $5.8-million contract for the Stage III Outlet Works (downstream tunnels) and the $4.6-million contract for the Stage IV Outlet Works (control shafts). The moving of the plant was on a subcontract by the William Reese Construction Co., Thief River Falls, Minn., which makes a specialty of moving grain elevators and similar structures.

Members of the Oahe Constructors combine are Foley Brothers, Inc., St. Paul, Minn.; Winston Bros. Company, Minneapolis, Minn.; Donovan Construction Company, St. Paul, Minn.; C. F. Lytle Company, Sioux City, Ia., and Missouri Valley Constructors, Inc., Leavenworth, Kans.

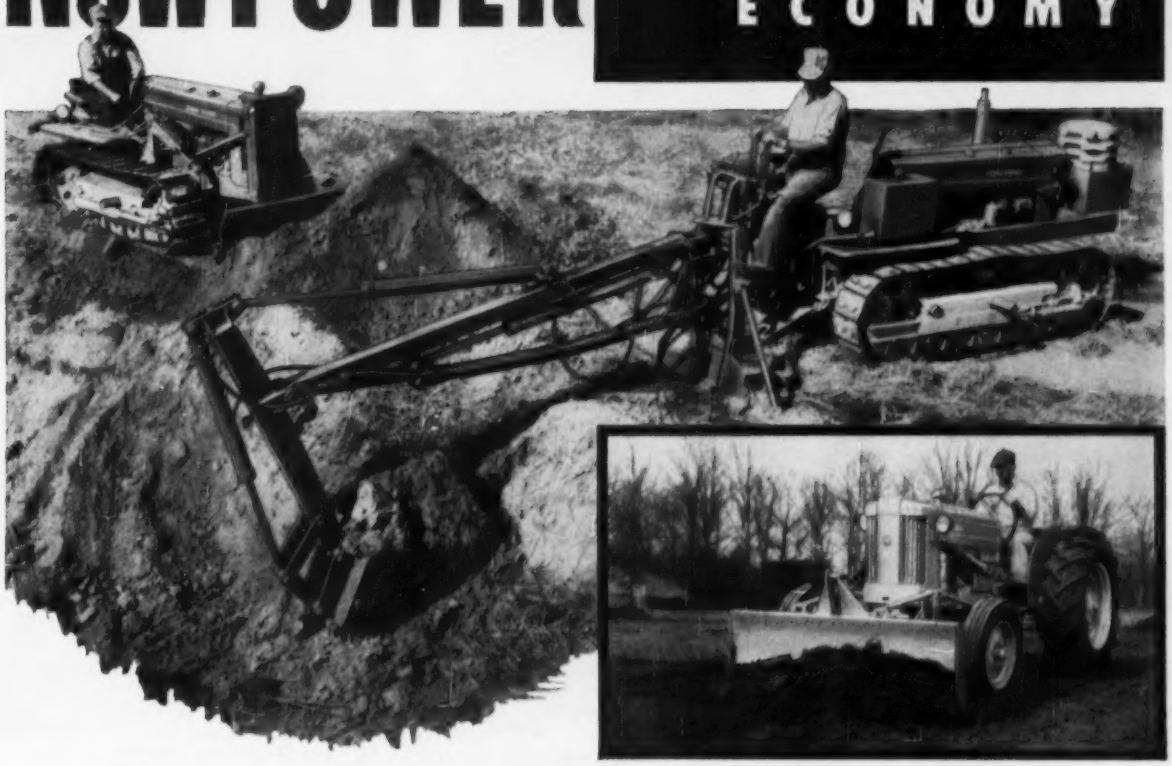
Oahe is a project of the Omaha District office of the Corps of Engineers. Col. Thomas J. Hayes is district engineer. John W. Sibert, Jr., is area engineer.

11% of Flood Repair Costs Goes for Engineering Fees

Fees paid to private engineering firms will amout to slightly more than 11% of the total cost of repairing Connecticut's flood-damaged town roads and bridges, Governor Abraham A. Ribicoff said recently.

The governor added that private engineering firms will receive $1.6 million of the $14.5 million allocated by the state for repairs to town roads and bridges as a result of heavy rainfalls late last year. The governor reported that the state had placed heavy reliance on private engineering concerns because of the shortage of technical personnel in the State Highway Department. The figures were released following criticism by Republican leaders of the size of private engineering fees on repairs.

New POWER ... TIME-PROVED JOHN DEERE ECONOMY



Top: HANDYMAN "420" CRAWLER . . . 25 drawbar h.p. . . . 4- and 5-roller sizes . . . little giant in work capacity. Shown with backhoe, one of its many matching tools.

Above: HANDYMAN "420" UTILITY . . . the low-built, highly maneuverable wheel-type tractor for all-around work. Three-point hitch regular. Shown with front-end dozer.

Everywhere . . . on all types of work . . . John Deere "40" Series Crawler and Wheel-Type Tractors have been making good with contractors, municipalities, and industrial users.

Now, the new "420" Series Tractors, *with 20 per cent more power,* offer you even better performance, even lower costs per job.

Here is the compact, rugged construction, the dependable day-in-and-day-out performance that enables you to get more work done in a given period.

Here is the all-around economy—fuel economy . . . oil economy . . . maintenance economy that sets new high standards—economy that means real dollars-and-cents savings, more profit each year of the tractor's long life.

Here is wide, all-around adaptability to jobs of all kinds, with a great matching line of John Deere and allied working equipment.

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W. Boyd Jones, contractor.

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Capture sun and sky for these

The City of Omaha, Nebraska, is investing in school "futures." Erecting substantial, well-designed buildings that will serve for many years. Insuring against premature obsolescence and future classroom shortages.

As an example of foresighted design, Truscon® Intermediate Classroom, Intermediate Projected, and Donovan® Steel Windows are daylighting these six recently erected Omaha schools.

Truscon Steel Windows are light, bright, weathertight. Being steel, they offer the inherent structural strength necessary for use in large unsupported glassed areas. They won't warp, swell, shrink or rot. They are designed specifically for school daylighting and ventilation.

Truscon offers window types and sizes for every elementary school, secondary school and college need, including classrooms, gymnasiums, auditoriums, cafeterias, dormitories, laboratories, power plants and offices. All are engineered to the application.

Sweet's File, section 17b/Tr, has more facts, specifications and details. Or, send coupon for your personal Truscon Window and Door catalog (A.I.A. File No. 16-E).

More Republic Steel Products for better school construction include Steel Lockers, Wardrobes, Shelving and Office Furniture made by Berger Division; Truscon Steel Joists, Ferrobord® Roofdeck, Metal Lath and Reinforcing Products; Republic ELECTRUNITE® *"Inch-Marked"® E.M.T. Rigid Steel Conduit; Republic ENDURO® Stainless Steel. Send coupon.*

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Steele, Sandham and Steele, architects.
H. W. Stitt Construction Co., contractors.

ADAMS SCHOOL
Truscon Intermediate Projected Steel Windows
Noel S. Wallace, architect.
A. Borchman Sons, contractors.

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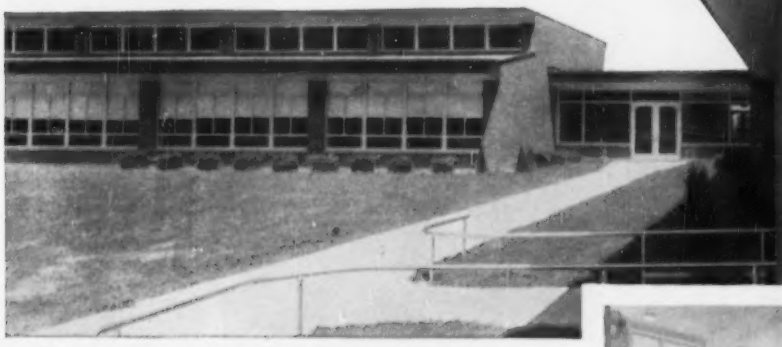
World's Widest Range of Standard Steels

JEFFERSON SCHOOL
Truscon Intermediate Projected Steel Windows
Steele, Sandham and Steele, architects.
Parsons Construction Co., contractors.

WINDOWS
Omaha schools



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Noel S. Wallace, architect.
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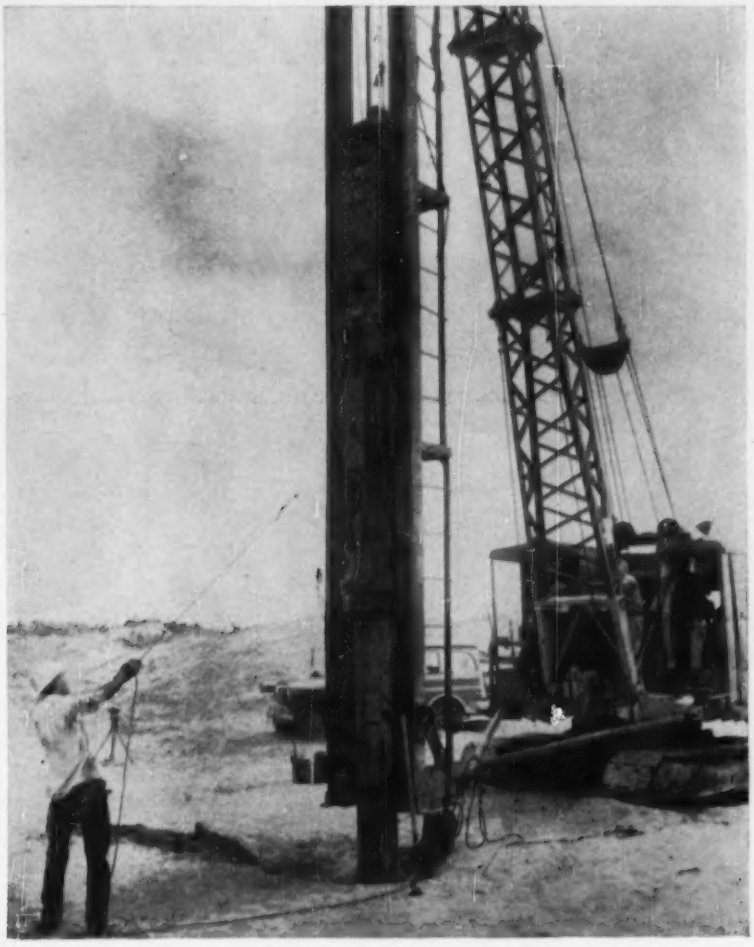


Diesel Pile Hammer Is Self-Actuating

A diesel-powered internal combustion pile hammer, said to be the first such machine to be built by a U. S. firm specializing in such equipment, was unveiled in a demonstration at Dover, New Jersey last week, by the McKeirnan-Terry Corp.

The unit demonstrated was labelled the DE 30, a completely self-contained hammer, with built-in fuel and lubricant reservoirs that require neither boilers nor air compressors.

A 3,000 lb ram delivered 44 to 55 strokes per minute, with an average force per blow of 18,000 ft lb. Operation seems simple: The hammer is worked by a single load line from a 30- to 35-ton crawler or truck crane, and is started simply by lifting the ram with the load line and allowing it to fall.

Once started, the hammer operates at a speed and stroke determined by pile resistance. During the downstroke, the ram actuates a metering pump that delivers a measured amount of liquid fuel into a pocket in the anvil block. When the ram strikes this block, the fuel is atomized by the impact, then ignited by the heat of compression. The resulting explosive force drives the ram upward ready for another stroke. During the upward travel of the ram, exhaust ports are opened to scavenge exhaust gases. On the next downward stroke, the ports are closed and the driving cycle is repeated. The hammer is stopped by pulling a single rope that disengages the fuel pump cam.

Company officials at the demonstration commented that the machine will operate on a minimum of fuel—sufficient capacity for over three days of operation is provided by the 25 gal fuel tank and 5 gal lubricant tank.

Manufacture of a smaller model—the DE 20, is due to start soon. McKeirnan-Terry Corp., Dover, N. J.

Small Compactor and Float For Widening, Patching Jobs

A new vibrating compactor and float, with a 30-in.-wide weighted float is self-propelled and powered by 3,600 vibrations per minute.

Designed for speed and economy, the manufacturer claims that the electromechanical compactors efficiently compact and settle granular soils, earthfills, ash, cinders and bituminous mixes. This makes them especially useful on road widening and patching, compacting earthfills, drainage and cover fill in trenches and numerous other construction and maintenance jobs.

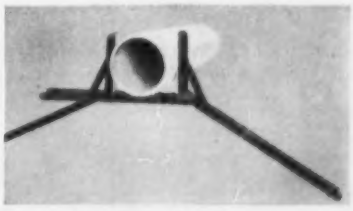
Totally enclosed, the vibrator mounted on the compactor does not require lubrication and is completely pressure tight and waterproof. Detachable weights make easy handling from job to job. Syntron Co., 328 Lexington Ave., Homer City, Pa.

Bull Float Can Be Tipped To Suit Any Desired Angle

A bull float, announced by the Cmetco Co. as an addition to its line of concrete placing and finishing equipment, has the name "cam-tilt".

By using the cam located in the strong back, the operator can twist the handle to suit the float instantly to give any desired angle. Floats of steel or wood in either 4- or 5-ft lengths are available. Creative Metals Corp., 1290 Powell St., Emeryville, Calif.

(*New Products continued on page 57*)



Pipe Vise

A new model pipe vise, designed to hold asbestos cement and clay pipe is now available. The new model, known as V-20, holds the pipe at a convenient working height and angle, and adjusts to hold 4- to 20-in. pipe. Spring Load Manufacturing Corp., 3610 First Ave., S. Seattle 4, Wash.

NEW Most Powerful One Man Chain Saw You Can Own

7 horsepower
29 pounds

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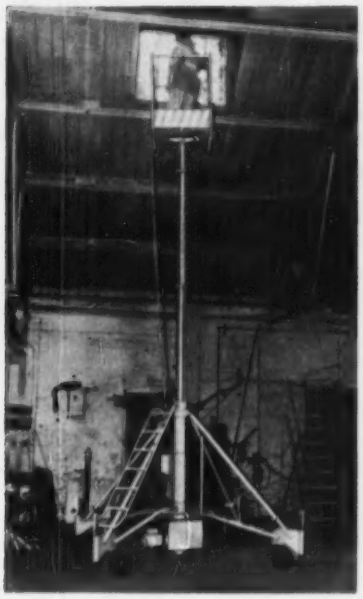
MODEL 17 — An all purpose saw that brings down trees up to 4 feet in diameter. Available with special brush cutting and clearing attachments for complete versatility 3.5 horsepower 22 lbs.

MODEL 5-20 — All the versatility of the 17 with added power, lighter weight. 5 full horsepower — 20 lbs. Brings down trees up to 6 feet in diameter.

MODEL EZ — Lightest, most powerful direct drive chain saw ever developed. Only 19 pounds, full 5 horsepower. Brings down trees up to 3 feet in diameter.



Mobile Access Lift Folds To Pass Through Narrow Way

Mobile access lifts, designed for maximum reach up to 42 ft above floor level, are now available from the Ballymore Co. of Wayne, Pa.

The hydraulically operated lift is said to emphasize ease of positioning, speed of elevation and safety and it may be used either indoors or outdoors. It folds up to pass through doorways, narrow corridors or in and out of elevators. Screw-type leveling jacks at each corner hold the lift in a steady level position and large swivel-type casters permit easy mobility. The mechanic using the lift also controls raising, stopping and lowering the mechanism by a pushbutton control located on the guard rail of the 2-ft-3-in. x 2-ft-3-in. platform. Platform load is rated at 350 lb. Six standard models, with reaches from 19 to 42 ft, are available. The Ballymore Co., Wayne, Pa.

V-8 Engines Supply Power For New International Trucks

A new "V-Line" of International heavy-duty trucks, with three new V-8 engines, is now in production.

Nine series of trucks in conventional and cab-over-engine, four- and six-wheel design, comprise the line. Models are available with gross vehicle ratings of 24,000 lb and up, and gross combination weights of 50,000 lb and up.

Power is supplied by new International V-8 engines of 401, 461, and 549 cu-in. displacement, with horsepower ratings of 206, 226, and 257 each. International Harvester Co., 180 N. Michigan Ave., Chicago 1, Ill.

Oversize Back Rippers Speed Dozing Operations

New oversize back rippers for Caterpiller D9 tractors have been introduced by Preco Inc.

The rippers comprise four housings with pivoted shanks capped with locked-on teeth. The housings are welded to the reverse side of the straight blade moldboard. The outer rippers dig into the ground about 18 in. as the tractor backs up. The inner shanks rip to a 12-in. depth. Moving forward, the rippers skid on top of the ground. Where desired one or more of the shanks can be pinned up out of the way. According to the manufacturer, the rippers speed all dozing operations by breaking out the hard ground and rocks when the tractor is normally dead-heading on the back-up trip, thus conditioning the soil for the blade to make a full load faster on its next forward pass. Preco Inc., 6300 E. Slauson Ave., Los Angeles 22, Calif.

Portable Power Tamper Has Adjustable "Walk" Rate

A new portable gasoline powered compaction tool, called the Vibra-Tamp, has been announced by Barco Manufacturing Co.

According to specifications, the compactor combines positive impact, imparted by high speed rotating counterweights, with intensive vibratory effect. The 27-in. tamping shoe delivers impact energy generated by the counterweight flywheels, the shoe being offset slightly ahead of the flywheels to produce a forward thrust that causes the machine to "walk" forward. The traveling speed is adjustable up to 50 ft per minute on level surface. Barco Manufacturing Co., 500 Hough St., Barrington, Ill.

Device Insures Safety Of Long Boom on Crane

A safety device which is claimed to be a positive means of avoiding accidental dropping of crane booms has been developed.

Invented by Bill Holmes, of Detroit, a crane operator for more than 30 years, the new control is said to be a positive automatic control, making it possible to regulate and control the

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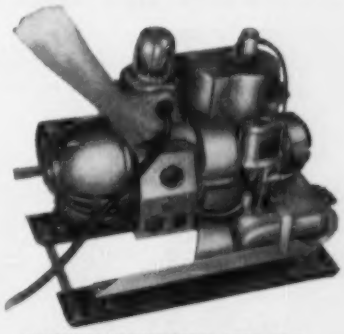

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Complete range of sizes and voltages up to 5,000 watts.

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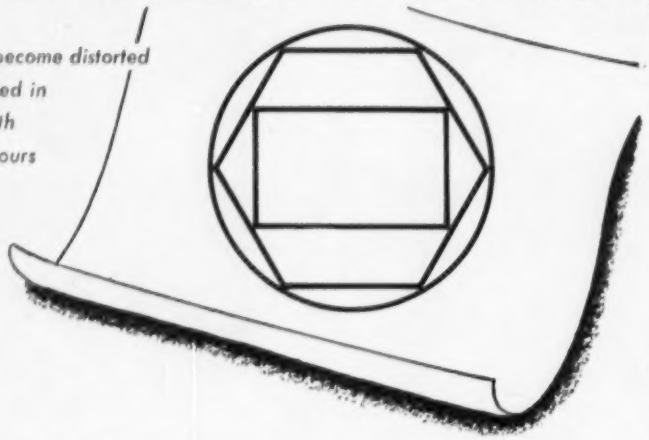
The Strange Case of the DISTORTION of CONTOURS

Contours become distorted when placed in contact with other contours



Arkwright Tracing Cloth Produces Contours in Clear, Clean Lines

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unwinding of the boom operating cable from its drum by coupling the drum movement to the engine of the crane.

The device can be installed in less than an hour. LEE A. CUSON, 507 McKERCHEY BLDG., 2631 WOODWARD AVE., DETROIT 1, MICH.

Quick-Change Trencher Teeth Require Only Ball Peen

A new set of 60 points in 30 minutes is said to be possible through the use of ESCO trencher teeth and ESCO bases.

The manufacturer says that this combination makes a ball peen hammer the only tool necessary to change trencher teeth. Peening is done at only one place at the base of the tooth—no side peening, no interference from adjoining teeth and bases. Patented design of the ESCO trencher tooth provides metal cast at the points of wear for longer life. ELECTRIC STEEL FOUNDRY CO., 2141 N. W. 25TH AVE., PORTLAND 10, ORE.

Three New Diesel Engines Added to Industrial Line

The Detroit Diesel Engine Division of General Motors announces three turbopower engines as additions to its Series 71 line of industrial two-cycle diesels. Now available are four- and six-cylinder fan-to-flywheel engines and a six-cylinder base-mounted power take-off unit.

The four-cylinder engine has a rating of 171 basic horsepower at 2300 rpm; the six is rated at 236 horsepower at 2100 rpm. Both engines weigh about 9½ lb per horsepower. DETROIT DIESEL ENGINE DIV., GENERAL MOTORS CORP., DETROIT 28.

Pipe-Pusher Eliminates Trenching for Small Jobs

Held as a new answer to underground pipe pushing to eliminate trenching and damage to streets, highway and landscaping is a hydraulic powered "Speed Thru" pipe pusher.

Gripped in a powered carriage, pipe penetrates earth with a continuous 21-in. thrust that is said to go easily through high density formations without alteration of power or change of speed. The machine can pull pipe as rapidly as it pushes by simply reversing the principle of operation with the machine remaining in its original position. Specifications say that the machine can average 4 ft a minute, pushing or pulling.

(Continued on page 60)

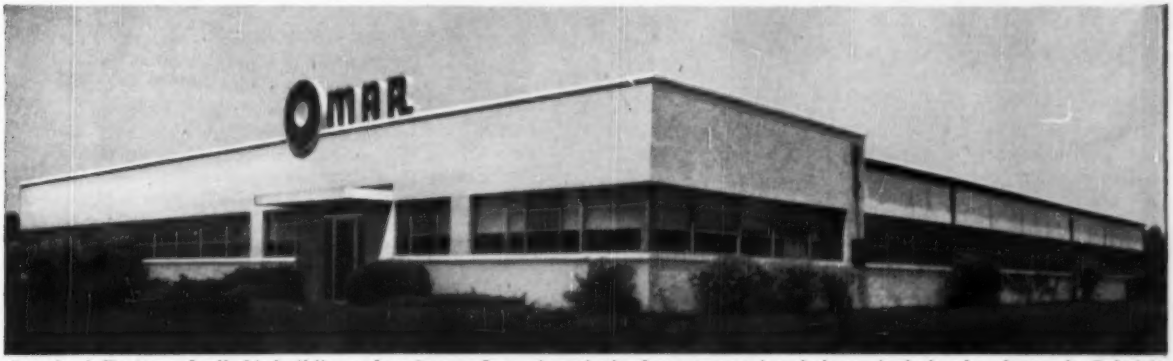
"Give us all the advantages of your standardization . . . in buildings that meet all the requirements of our distribution operation." And Luria did!

WHY OMAR, INC. CONTINUES TO BUILD WITH LURIA...31 BUILDINGS IN SIX YEARS!

$10,000,000 Expansion for aggressive midwest baking concern includes 31 Luria Steel Frame Buildings of flat roof type.

Operations Sections are efficient, pleasant working spaces incorporating general offices, managers offices, meeting and utility rooms.

Internal Loading. All units contain internal garaging facilities and underground gasoline storage.



Standard Design of all 31 buildings for Omar, Inc., America's fastest growing bakers, includes handsome buff brick walls, built-up roofing, steel sash and doors. Identical floor plans make every Omar branch familiar to all route men.

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X . . . Use Flintdek around machinery, on pedals, steps and ladder treads . . . on ramps, platforms, floors and decks. In locker rooms, lavatories, showers. It's your sure protection against slipping.

X . . . Flintdek is *not* a paint. It is a synthetic, resinous plastic containing a mineral filler—offering a surer footing when surface is wet. Comes in 5 harmonizing colors.

X . . . Flintdek is resistant to fire, water, oil, gasoline, dilute acids, alcohol, fats and greases. Properly applied, it won't chip, crack or peel. And it's *easy* to apply . . . you simply trowel it on!

X . . . Flintdek offers you safety you can count on. It is classified and listed as an anti-slip flooring surface by Underwriters' Laboratories, Inc. And its COST is low . . . covers approx. 50 sq. ft. per gallon.

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In London, England: Industrial Asphalts Company, Ltd.

. . . New Products

The operation is entirely one man, with two controls. The machine is delivered as a complete unit including a gasoline engine, dc truck power or ac electric hydraulic power unit as desired. MERCURY HYDRAULICS, INC., 2440 BLAKE ST., DENVER 5, COLO.

Add Two New Groups To Clamshell Bucket Line

Two new groups have been added to the Erie line of clamshell buckets: ¾ to 4-yd light rehandlers, and ½ to 2-yd extra-heavy-duty hard diggers are now available. The use of equalizer bar arrangement makes it possible to adapt the line to 3- or 4-line application.

The addition of the new buckets brings to six the number of 2-line models offered by Erie Strayer. THE ERIE STRAYER CO., ERIE, PA.

New Power Transmission Boosts Prime Mover Torque

The Model R-15 Moto-Bug, an all-around material handler, is said to have been improved in performance by the introduction of an automatic power flow transmission as standard equipment. According to the manufacturer, the new transmission gives the Moto-Bug an extremely smooth and simple operating action, correcting power flow output automatically in direct ratio to power requirements without shifting any gears or using a clutch pedal. A simple directional lever regulates either forward or reverse travel. Speed on the machine, with automatic power transmission power, has been increased to 12 mph. KWIK-MIX CO., PORT WASHINGTON, WIS.

Stabilization Pugmill Designed for Special Mixes

A low-cost, high-capacity mixing pugmill, designed for the needs of stabilization mixing, has been announced by Barber-Greene Co.

With job tonnages in stabilization work often exceeding the 100,000-ton point, the 350-ton-per-hour capacity of the twin-shaft pugmill is said to promise lower job costs through quickest completion. Thorough mixing of the material is assured by the twin-shaft mill and through the use of a hydraulically controlled discharge hopper that serves as a dam to control the height of the material in the pugmill and the duration of the mixing. BARBER-GREENE CO., 400 N. HIGHLAND AVE., AURORA, ILL.

Publications

Sewage pumps—A reference manual on pumping and sewage treatment equipment has been published primarily to give detailed information for selecting vertical wet pit pumps and pneumatic ejectors. A special "selector guide" lists the manufacturer's various products, model numbers, typical applications, and the specific technical bulletin which describes the product in question. A two-page section is also devoted to sewage and industrial waste treatment systems. Copies of this Manual 1114 are available on request. YEOMANS BROTHERS COMPANY, 1999 NORTH RUBY STREET, MELROSE PARK, ILL.

Bar screens—A 12-page bulletin describes in detail the back-cleaned bar screen for sewage plants and industrial waste treatment installations. Drawings and pictures illustrate the unit, and a suggested specification is also included. WALKER PROCESS EQUIPMENT, INC., AURORA, ILL.

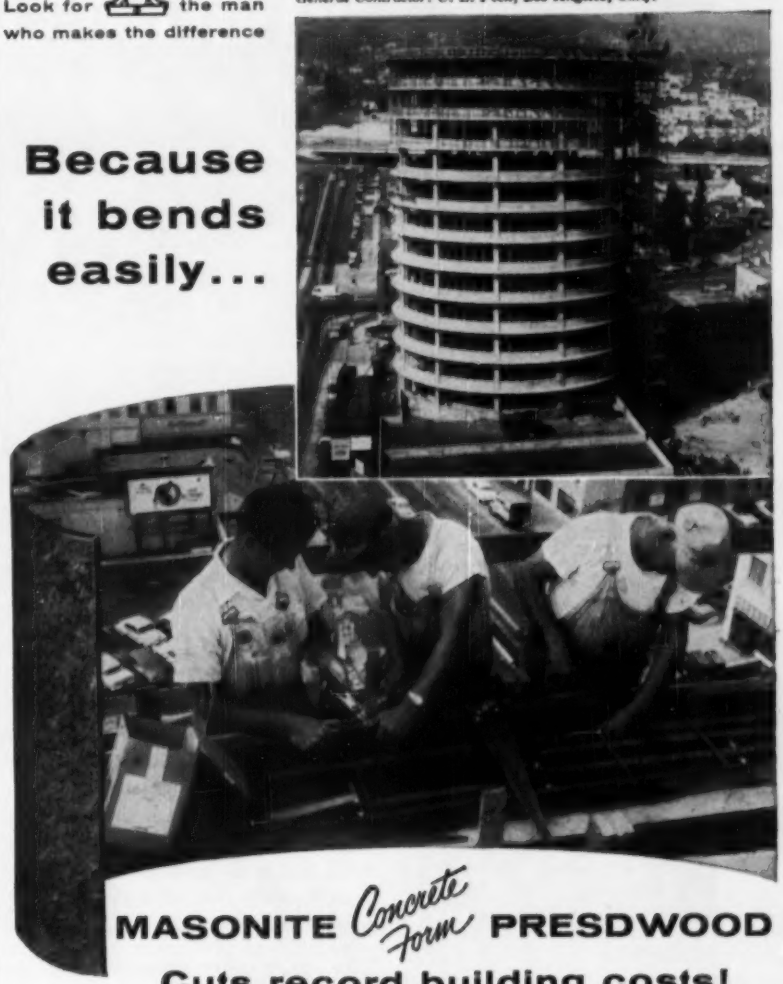
Power instrumentation—Thirty-two-page Bulletin 9070 describes complete instrumentation for the electrical end of power generation. Dimension drawings and typical specifications are included together with illustrations of various methods employed in power plants to centralize instrumentation. MINNEAPOLIS-HONEYWELL REGULATOR CO., INDUSTRIAL DIV., WAYNE AND WINDRIM AVENUES, PHILADELPHIA 44.

Bituminous mix plants—Three new 8-page bulletins describing the three sizes of continuflo bituminous mix plants has been published by Pioneer Engineering Works. Discussed are Model 51 plant, with a capacity of 40 to 60 cu yd per hr; Model 81, from 60 to 80 cu yd per hr; and Model 102, with production ranging up to 150 cu yd per hr. PIONEER ENGINEERING WORKS, INC., MINNEAPOLIS, MINN.

Mix design methods—A new 168-page pocketsize manual published by The Asphalt Institute contains authoritative information and instruction for the design of mixes by the Marshall, Hveem, Hubbard-Field and Smith Triaxial test methods. Test procedure and interpretation of test data are provided for each mix design method, and appendices include information on gradation analysis of aggregates and the density and voids analysis of compacted paving mixtures. THE ASPHALT INSTITUTE, COLLEGE PARK, MD.

Look for the man who makes the difference

Capitol Records Building, Hollywood, Calif.
Architect: Welton Becket, FAIA, Los Angeles, Calif.
General Contractor: C. L. Peck, Los Angeles, Calif.



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Cuts record building costs!

Here's a unique design—the world's first circular office building.

And a unique material formed the spandrels. Masonite Concrete Form Presdwood® bends readily to form gentle, sweeping curves, arches and rounded columns. These dense, tough, hardboard panels leave a glassy-smooth concrete surface with no blemishes of wood grain or knots. They can be used again and again. In 4′ widths and lengths to 12′, they reduce the number of joints and they're easy to cut and fit.

You can cut costs 3 ways!

1. Screen side to concrete—for unpainted surfaces. Tiny projections left in concrete cut hand-rubbing cost up to 50%.
2. Screen side to concrete—for painted surfaces. The textured surface left in concrete forms an excellent bond for paint. Only minimum rubbing required.
3. Smooth side to concrete—for painted or unpainted surfaces, rubbing virtually eliminated. No knots, grain or blemishes in Masonite Presdwood to mar the finished concrete surface.

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Address.....

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County.....*State*.....

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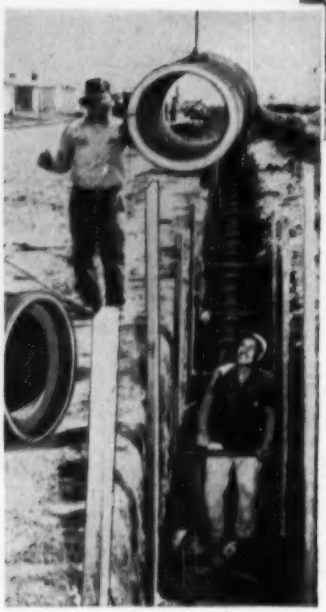
first choice for *Another* BIG Housing Project!



TORRANCE, CALIFORNIA is attracting new families by the thousands with an unusual combination of job opportunities, ideal climate, and beautiful beaches. To meet the tremendous demand for modern housing, the vast Southwood Homes project is well underway, with a total of 2200 new homes planned and 816, comprising the first unit, already under construction. More than 67,000 feet of 4 through 18-inch Vitrified Clay Pipe have been installed as house connections, feeders, and mains.

Like many other mass-construction builders, those in charge of Southwood Homes know that it pays to use the best in sewerage materials. It pays in faster, more economical construction, as well as in dependable, trouble-free service—since Clay Pipe is the only sewerage material that is guaranteed . . . and *never wears out.*

Owner, subdivider, and contractor: Milton Kauffman—Don Wilson Co.

Sewer system designer: The Engineering Service Corp.

Sewer contractor: N. A. Artukovich Construction Co.

Vitrified

CLAY PIPE

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NATIONAL CLAY PIPE MANUFACTURERS, INC.

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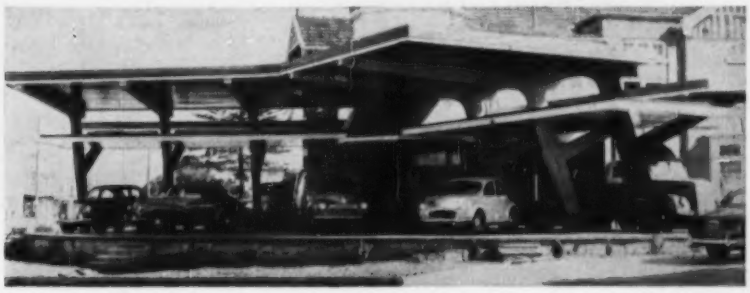
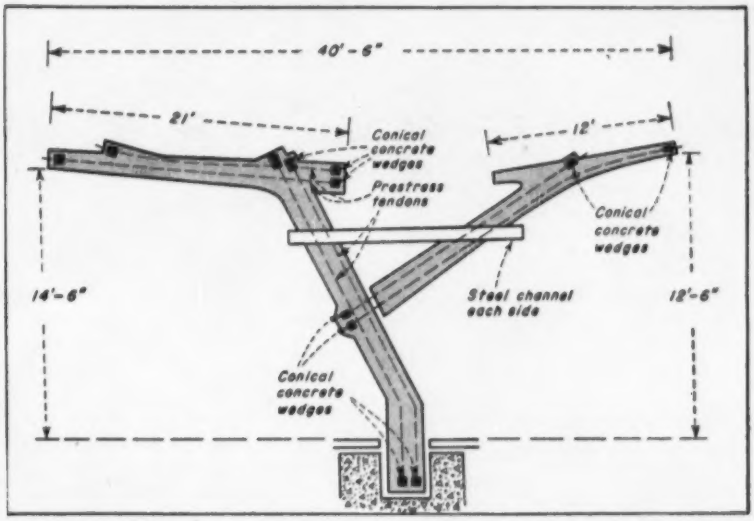
Progress in Public Health - Through Clay Pipe Research



ONE-LEG FRAMES of prestressed concrete spread a 40-ft-wide, three-level canopy over an auto display shelter in Sydney, Australia.



Y-SHAPED BENT was precast at the site as two units, then assembled on the ground. Prestressing cables tie the units together.

Prestressed 40-Ft Y-Frames

In an eye-catching structural arrangement, six Y-shaped one-column frames of prestressed concrete span 40 ft to carry to 3-level roof of an auto display shelter in Sydney, Australia. The building is L-shaped in plan, with a center row of frames in each wing. With this layout, the wings brace each other laterally through the roof purlins.

To carry two of the three roof sections, an integrally cast beam cantilevers outward from the top of each arm of the Y. The beam tips are 40 ft 6 in. apart. The third section, roofing the middle of the shelter at a lower level, rests on steel channels that join the arms of the Y a few feet above the fork.

Each frame is composed of two prestressed concrete members, plus the steel channels.

The heavier member, which includes the main stem of the Y, is buried 2½ ft in the foundation to resist lateral loads. Above ground, it rises straight up for 2 ft, leans about 20 deg and angles upward another 12 ft, and finally levels off and continues outward for 18½ ft. This almost level section is the girder for one section of the roof.

The lighter member of the frame begins about 6 ft above ground, angling up at 90 deg from the main stem. Then, like the stem, it also levels off to form a girder.

The frames were precast at the site. Using a fast-setting mix with a two-day compressive strength of 7,000 psi, the builder cast each frame in two monolithic units—the main stem and one roof girder, and a branch of the Y and the other girder.

The stem unit was prestressed with four parallel-wire cables, two in the upright part and two in the girder. The smaller member was prestressed with two cables, both anchored in to main stem at the point where the two members are connected. All cables were sheathed in lead-coated steel tubes.

Donald Fabbro, of Fabbro & Kallista, Sydney, designed the structure.

New Drydock at Naples; No. 2 on the Mediterranean

A new $16-million drydock—the second largest on the Mediterranean Coast—has been opened in Naples.

The facility, second in size only to Toulon's, is 1,145 ft long. It has a 131-ft minimum entrance width, a 869-ft maximum width and a 44-ft depth.

One feature of the dock is that it has two entrances to permit greater elasticity in operation. Since it is provided with intermediate slips by subdivision of the basin, repairs of smaller vessels can be carried out independently in the partial basins.

The dock's masonry work is of reinforced hydraulic concrete, a mixture of limestone and pozzolana, to which pozzolana—ground as fine as cement—is added. This cement was poured into place with the aid of a large, compressed air, moveable caisson.

The floor is 27 ft thick and laid 70 ft below sea level. The slips are closed by floating gates that allow the basin or basins to be emptied—and also permit them to be flooded because of partitions made in the planking.

The pumping plant consists of a group of three helico-centrifugal tanks with vertical axis. Each tank has a capacity of some 20,000 cubic meters per hour, which allows the whole basin to be emptied in three hours. The plant is fitted with a group of three drying pumps and three draining pumps that also are helico-centrifugal.

Steel Arch of 1,062 Ft Is Begun in Britain

Foundation contract has just been awarded for a steel arch highway bridge over the Mersey River between the towns of Runcorn and Widnes near Liverpool, which will have the longest span of its type in the British Isles. Measuring 1,062 ft, the main span will be flanked by 275-ft side spans and long viaducts.

The arch type is said to have been selected over a suspension design after model studies indicated that unde-

Check the response-to-the-touch. You can actually feel the difference!

That's why the Paragon Drafting Machine noticeably cuts end-of-the-day fatigue . . . saves costly man hours . . . helps raise working standards.

See how easily protractor control ring can be reached—no matter what position your hand is in. Another time saver. Touch that ring with your *little* finger and scales rotate freely. Release pressure and scales automatically lock to nearest 15° position. And intermediate angles are just as easily set!

Top day-to-day performance is guaranteed by unique "open center" design of arms which protects smooth-working factory-set band tension.

A good look at a Paragon and a touch on that control ring is worth 1,000 words! Try it before you buy *any* drafting machine—you can *feel* the difference.

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. . . International

sirable wind effects would occur as a result of an adjacent railroad bridge. The new bridge, with a 33-ft roadway and a 6-ft sidewalk, will replace an old transporter type bridge, which had become inadequate to serve modern traffic. The national government, through its Ministry of Transport and Civil Aviation, will defray 75% of the cost of the $5.6-million structure. Mott, Hay and Anderson of London are the consulting engineers.

Pacific Port Improvement Is on Nicaraguan Schedule

A $4.5-million improvement program for Nicaragua's Pacific port of Corinto has been launched with the aid of a $3.2-million World Bank loan.

The three-year program, under direction of the Corinto Port Authority, will include construction of a 1,200-ft reinforced concrete wharf, transit sheds with a 125,000 sq ft area, and rail and road facilities.

Corinto, which handles three-fourths of the Republic's exports and imports, is considered to be the most important port on the Central American Pacific Coast. Increased commercial activity in Nicaragua during the past five years has badly strained facilities, and the new program was set up to increase the port's capacity to handle both ships and cargo.

New English Road Program

A $7-million contract for building the 8-mi-long Preston by-pass has been awarded Tarmac, Ltd., of London. Work, started this month, is expected to be completed in about two years.

The new road will begin at Bamber Bridge south of Preston, by-pass the town on the east, and then end three miles north on the Preston-Lancaster road.

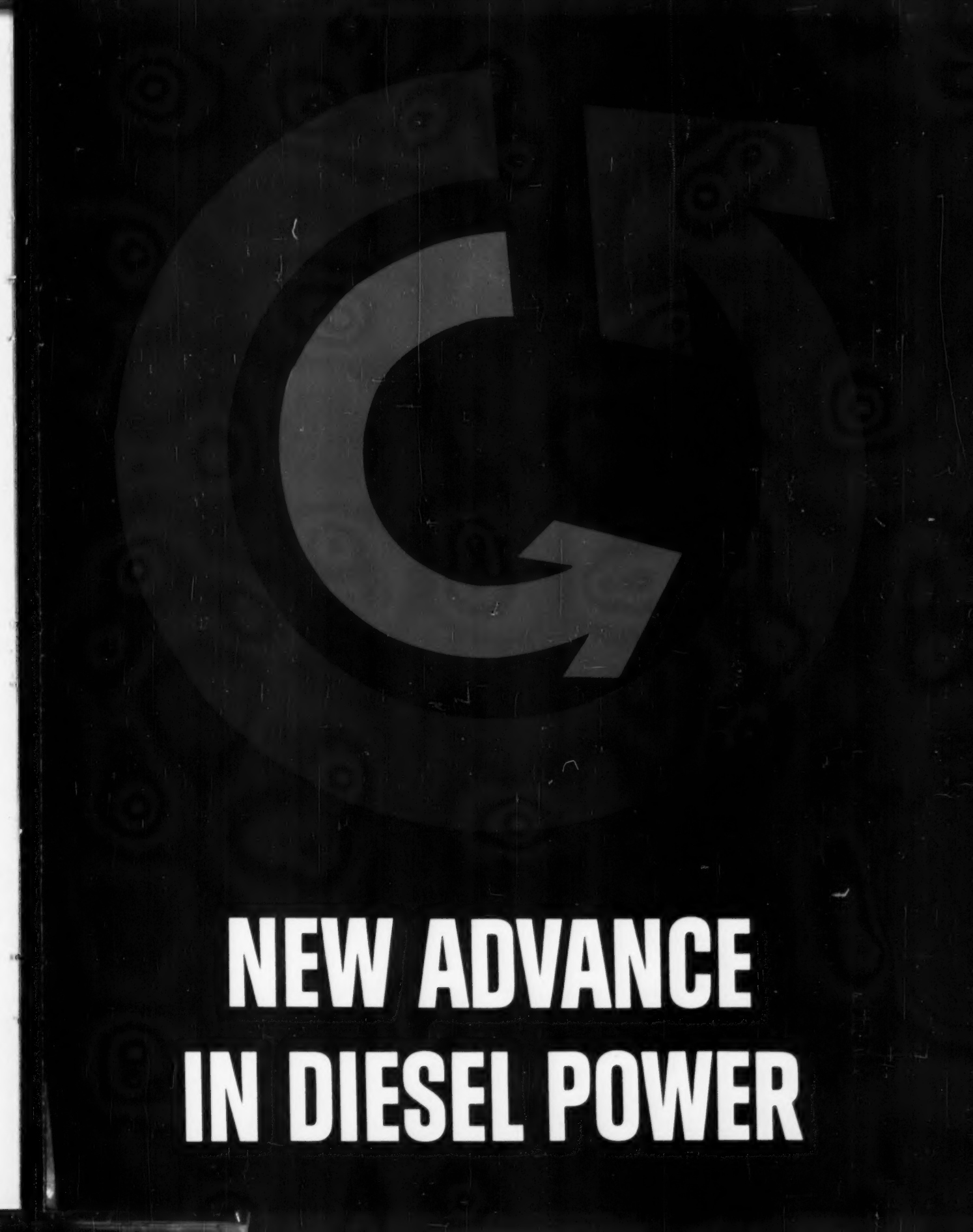
Another 2.6-mi by-pass project—at Longton on the Liverpool-Preston road—has not yet been granted final approval by the Ministry of Transport. But the contract, of about $500,000, is expected to be placed shortly.

Poles Plan Highway Program

What government sources said will be the biggest road construction program in Poland's history was announced recently in Warsaw.

Directives for a five-year plan, extending to 1960, call for 1,864 miles of new roads to be built by that date, and modernization of 3,728 miles of old roads.

A treasury fund of $135 million has been allotted to pay for the program.


NEW ADVANCE
IN DIESEL POWER

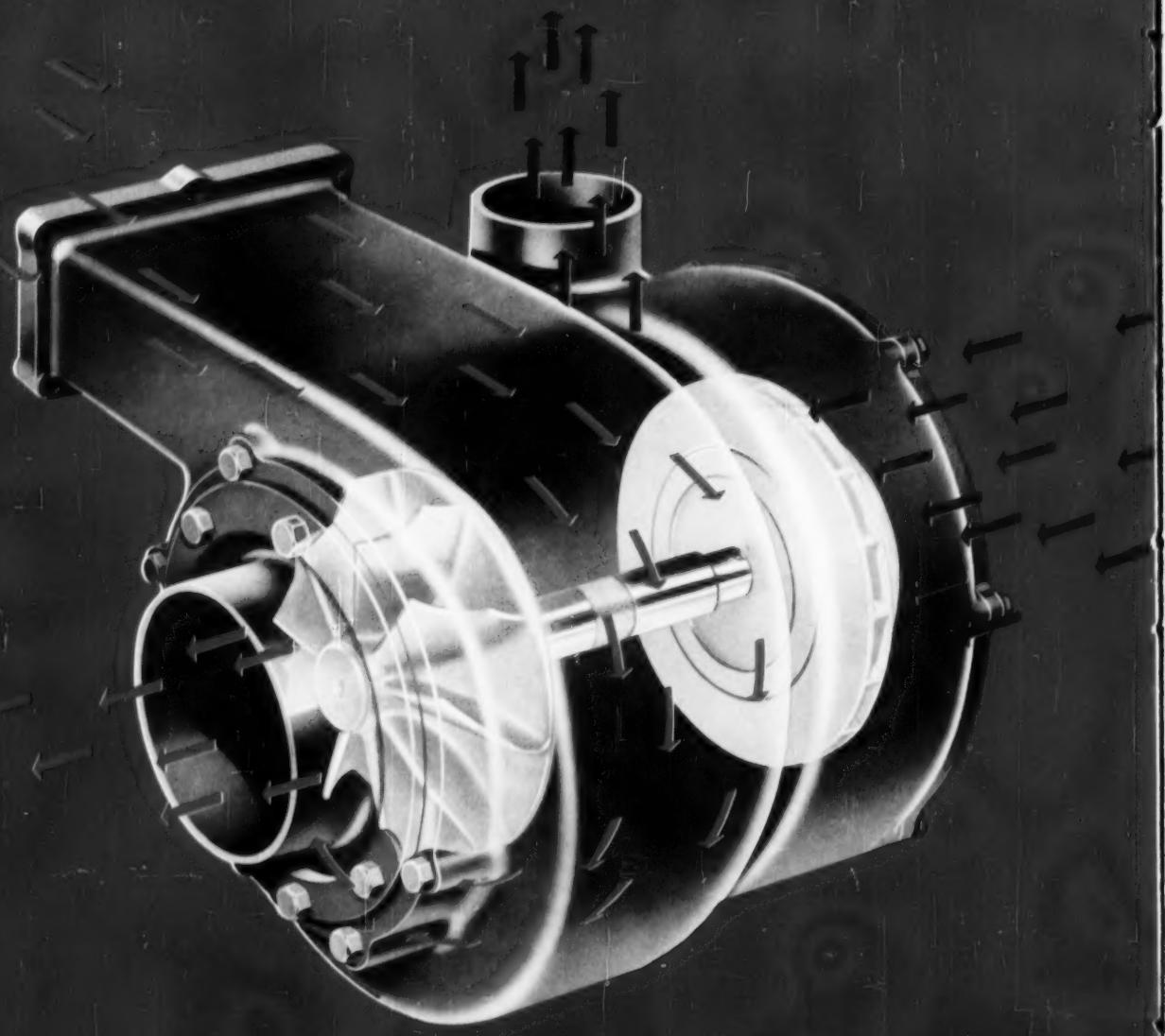
CUMMINS

TURBODIESEL

ENGINE

(trademark)

ONLY CUMMINS OFFERS A COMPLETE LINE OF *TURBODIESELS*! . . . THE LATEST AND MOST ADVANCED IMPROVEMENT IN DIESEL POWER!



Cummins *TURBODIESELS* convert ordinarily wasted power into usable power! This means more work from the same amount of fuel.

A *TURBODIESEL* is a Cummins engine that utilizes the normally wasted energy of exhaust gases by means of a turbocharger to develop additional horsepower. More power is obtained from a *TURBODIESEL* than from a naturally aspirated engine or engine of equal displacement, reducing the weight per horsepower. By forcing more air into the cylinders, the turbocharger makes possible more efficient burning of a greater fuel charge, creating additional horsepower.

➡ The red arrows trace the flow of exhaust gases through a turbine chamber which turn a turbine wheel (left). The turbine wheel is mounted on the same shaft as the air impeller (right) in the air chamber.

➡ The blue arrows indicate how the rotation of this impeller draws air from the outside and blows it under pressure into the intake manifold and engine cylinders.

and what it offers to power users!

LOWER FUEL CONSUMPTION

Cummins *TURBODIESELS* deliver greater fuel economy than either non-supercharged or mechanically supercharged gasoline or diesel engines.

MORE HORSEPOWER, BETTER PERFORMANCE

Cummins *TURBODIESELS* deliver more horsepower than non-supercharged or mechanically supercharged diesel engines of equal displacement.

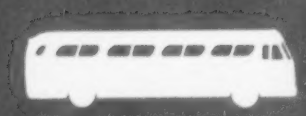
SMALLER SIZE, LOWER WEIGHT

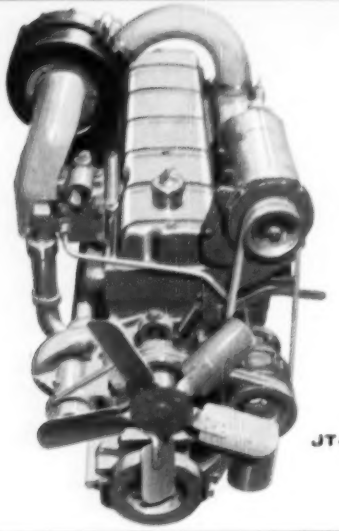
Cummins *TURBODIESELS* are more compact, weigh less than non-supercharged or mechanically supercharged diesels of equivalent power.

How Cummins *TURBODIESELS* offer more profit to power users:

3 *big advantages!*	1 More work on the same amount of fuel!	2 More power for better performance!	3 More power per lb. of engine!
over non-supercharged diesels!	If a non-supercharged diesel does this much work per gallon of fuel:	If a non-supercharged diesel delivers this much horsepower per cubic inch of displacement:	If a non-supercharged diesel delivers this much horsepower per pound:
and over supercharged diesels!	a supercharged diesel will do this much work:	a supercharged diesel will deliver this much:	a supercharged diesel of equivalent weight will deliver this much power:
	but a Cummins *TURBODIESEL* will do more work per gallon of fuel than either!	but a Cummins *TURBODIESEL* will deliver more than either!	but a Cummins *TURBODIESEL* of equivalent weight will deliver more power than either!
If you run trucks or buses	Work is *mileage*. Cummins *TURBODIESELS* mean more ton-miles per gallon than gasoline or other diesel engines.	Cummins *TURBODIESELS* make possible faster schedules . . . better performance on hills . . . at altitudes . . . in traffic, than gasoline or other diesel engines.	Cummins *TURBODIESELS* make possible bigger pay loads . . . dependable diesel power and economy . . . more profit.
If you use construction, mining, logging, drilling or marine equipment	Work is production. Cummins *TURBODIESELS* work longer on the same amount of fuel than gasoline or other diesel engines.	Cummins *TURBODIESELS* make possible faster work cycles . . . greater work loads . . . better all-around performance.	Cummins *TURBODIESELS* increase payload capacities . . . simplify movement to location . . . allow greater cargoes.

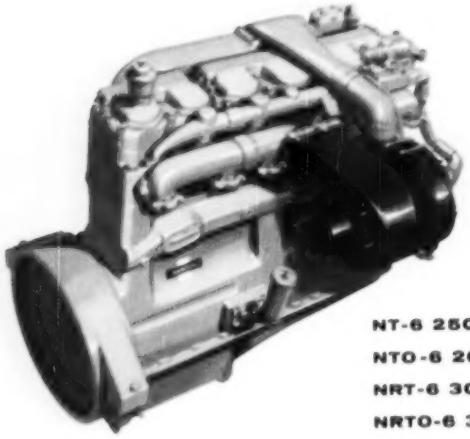
Cummins offers a full range of power for all applications!





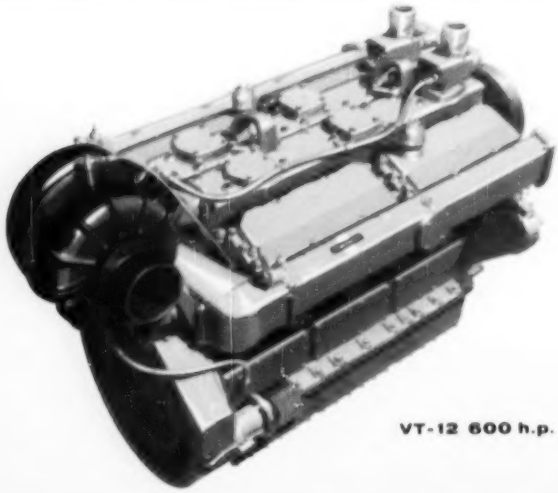
JT-6 175 h.p.

TRUCKS
BUSES
CONSTRUCTION
MARINE



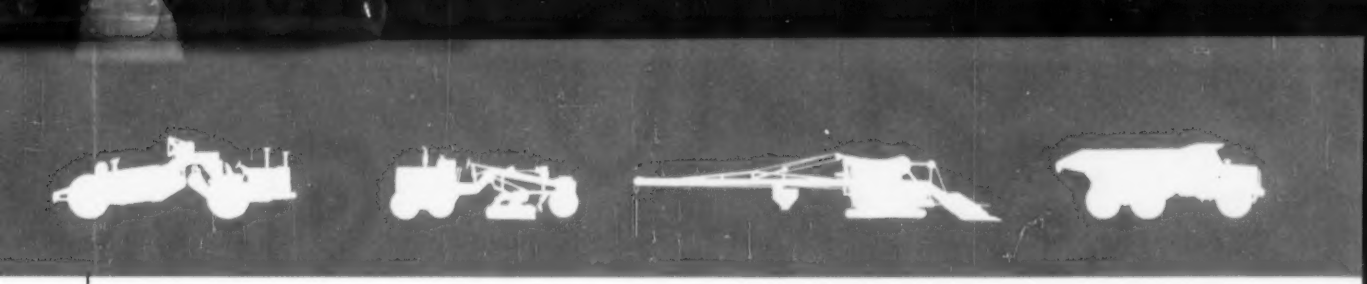
NT-6 250 h.p.
NTO-6 262 h.p.
NRT-6 300 h.p.
NRTO-6 335 h.p.

CONSTRUCTION
MINING
TRUCKS
LOGGING



VT-12 600 h.p.

MARINE
DRILLING RIGS
GENERATOR SETS
CONSTRUCTION



EFFICIENCY

Here is the engine that is revolutionizing the truck and bus industries. The JT weighs from 450 to 800 pounds less than other diesels of comparable power. This tremendous weight advantage means that diesel truck operators can earn from $1000 to $2000 in additional revenue every 100,000 miles. (Based on 300 trips of 300 miles each, and revenue of 80¢ per 100 lbs.)

More than 100 million miles of on-the-job performance have proved the JT's unmatched efficiency and economy as an automotive engine. The JT gives you maintenance costs lower than other diesels, *and as low as gasoline!* Compared to gasoline, the JT gives a 25% saving in maintenance hours!

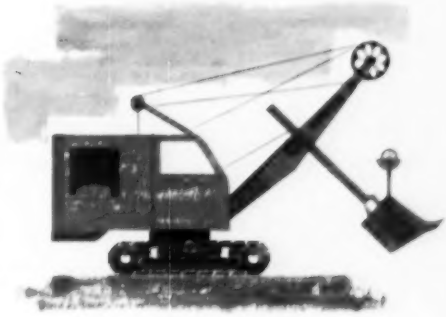
The JT also is ideal power for medium construction, mining or marine equipment. This engine delivers the rugged, dependable performance that cuts work cycles—lowers operating costs.

POWER

Any piece of equipment powered by an internal combustion engine in this horsepower range will operate more efficiently, and economically, powered by one of these four great Cummins *TURBODIESELS*.

Cummins gives you a choice of horsepower so that you can accurately tailor power to your job needs. This avoids the excessive initial costs inherent in overpowering . . . the excessive fuel and maintenance costs inherent in underpowering.

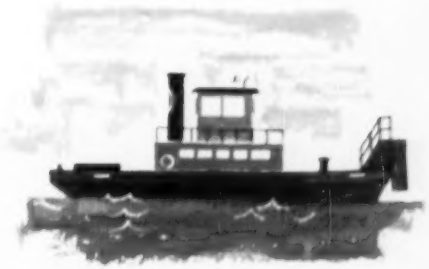
These four great *TURBODIESELS* are thoroughly job-proved. They are particularly popular in construction and mining equipment, where their big power makes possible faster work cycles and more payloads.



DEPENDABILITY

Here is big power in a compact package. No other commercially available engine of comparable horsepower approaches the VT-12 Cummins *TURBODIESEL* for light weight and small size. The VT is easily moved from one location to another. And it costs much less than heavier, slow-speed diesels which develop comparable horsepower.

The VT-12 *TURBODIESEL* can cut the cost in any installation which must be moved from location to location, such as an oil well drilling rig. It makes possible higher powered portable generator sets and pumping units. In marine applications, it frees valuable space for cargo carrying. The VT-12 can be compounded to provide up to 2,400 h.p.



Cummins *TURBODIESELS* give you these advantages, too!

RESEARCH AND PRODUCT DEVELOPMENT. Continuous pioneering, research, experimentation and quality building has helped make Cummins the world's leading independent manufacturer of diesel engines. Meeting the ever-changing needs of power users by being first with the latest advances in diesel design and engineering keep "Cummins" the finest name in diesels. For more information, write for the free booklet, "Answers to Questions about Diesels."

READILY AVAILABLE PARTS AND SERVICES. Cummins worldwide distributor organization . . . the largest devoted to the sale and service of diesel engines . . . offers expert service and genuine Cummins parts at nearly 200 points throughout the United States and Canada and in over 100 export locations. Special job-site service is also offered.

LOWER FUEL AND MAINTENANCE COSTS. Cummins simple 4-cycle, overhead valve design is easy to service—assures long engine life—requires little "between-overhaul" maintenance—is easily understood by mechanics. Cost of replacement parts is low, minimizing overhaul expense. Cummins exclusive PT fuel system contains fewer parts—is easier to understand and maintain than gasoline carburetion and ignition or other diesel fuel systems. Foolproof and troublefree, this revolutionary method of fuel injection drastically reduces downtime due to fuel system failures.

MINIMUM PARTS INVENTORIES. Bearings, pistons and many other parts are interchangeable on many Cummins models. This standardization reduces overhead in parts stock—assures time and space savings—lowers maintenance costs. All components are made to exacting engineering standards under strict quality control to assure uniformity . . . lower your overall maintenance costs.

SPECIFY CUMMINS WHEN YOU BUY. It's easy to standardize on Cummins Diesels. Over 80 manufacturers of heavy equipment offer Cummins Diesels as power in over 500 models. The names of these manufacturers can be yours for the asking. Get your free copy of "Cummins Who's Who" by writing to the Cummins address listed below.

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For further information consult the Cummins Distributor in your area or write direct to:

Cummins Engine Company, Inc.

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Bulletin 950135 LITHO U.S.A.

Multipurpose river projects to be analyzed by . . .

Unique Seminar at Harvard

Harvard University's recently announced water resources research program (ENR May 10, p. 51) is expected to prove new and more exact methods for analyzing multipurpose, multiproject river development.

Beginning this fall, a faculty team of engineers, economists and social scientists, occasionally supplemented by outside water resources experts, will meet once a week with ten "students," actually mature officials of federal water resources agencies. Financed by a $150,000 grant from the Rockefeller Foundation, this group will attempt first to apply new tools, such as linear programming and perhaps non-linear programming, in the design of a multipurpose water development. At a later stage, the three-year seminar will consider problems related to the collection and analysis of physical and economic data, public policy objectives, legal and institutional aspects and application to underdeveloped areas.

This order of analysis—actually just reverse from the logical order of water resources planning—is proposed to give emphasis to the intended major research contribution of the Harvard program, the application of new techniques to the design and operation of complex water developments.

The seminar's directors feel that maximizing of benefits from a water project by the well-known technique of marginal analysis is an impractical procedure. In its simplest form, marginal analysis involves adding project increments until the returns from the last increment are just equal to the costs of adding that increment. At this point, net benefits are maximized.

In actual practice, water resources agencies never apply this technique to the proper degree of refinement in view of agency limitations of time, funds and available date. Instead, an empirical approach is employed, relying on trial and error methods, and only a few of the many possible combinations of project units and purposes are thoroughly investigated.

The Harvard seminar believes that simplified variation of the pure marginal analysis—for example, linear programming with electronic computers—is applicable. It will attempt to prove this on specific case problems: the Delaware River basin in the east and the Washita River basin in Oklahoma and Texas.

Besides its research objective, the seminar will provide advanced training for thirty federal water resources men—each year a new group of ten Fellows will be chosen. A derivative objective of the program is that members of Harvard's engineering faculty will combine for the first time with experts in the social sciences in public policy discussions.

Each year's ten trainees will be admitted to the Graduate School of Public Administration and, in addition to the research seminar, will take three courses each semester in related fields. At year's end, the students will receive a degree of Master of Public Administration.

Prof. Arthur Maass, in charge of the seminar, has assembled a leading array of experts for the program. Regular participants in the seminar will include Gordon Fair and Harold Thomas. Parttime members may include Karl Terzaghi, Arthur Casagrande and Charles Brooks, of the Harvard faculty, and outsiders such as Walter Langbein and Luna Leopold of USGS, Eugene Weber of the Corps of Engineers, Edward Cleary of the Ohio River Valley Water Sanitation Commission, and William Hiatt of the U. S. Weather Bureau.

All of the major federal water resources agencies are cooperating by providing basic data, assigning key employees as students and sending senior experts to certain seminar meetings.

STUDENT-CONSULTANTS explain $100 million Wilmington, Del., waterfront redevelopment to city officials. From left, students Wm. Craig and Alfred Layton, Mayor August Walz, city engineer Edwin Koester, ASCE Delaware Section president Joseph Staley.

Getting Students to Think

Engineering departments at the University of Delaware and Johns Hopkins University have been singularly successful in giving advanced students practical consulting experience and, in the process, bringing forth some highly creative engineering thinking.

Paul J. Brennan, head of Delaware's Civil Engineering Department, posed this situation to a group of seniors enrolled in an advanced course in civil engineering planning: The nearby city of Wilmington has contracted with a consulting firm (the student group) to plan redevelopment of the entire navigable waterfront area within city

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limits. Objectives are to provide facilities for potential industry and shipping, relieve present congested vehicular traffic in the area, develop new recreational and cultural areas and beautify the city.

Fourteen students spent the better part of a semester in coming up with a $100 million plan. Their scheme included construction of a 4,000-ft high level bridge, four new piers, three warehouses, a marine railroad, new bulkheads, a marine repair shop, a harbor administration building, dredging of the harbor, and redevelopment of 30 square blocks of slum and blighted areas.

The neophyte city planners presented their dream to the Delaware Section of ASCE. The practicing engineers had unqualified praise for the students' broad original thinking while local newspapers gave the student plan front-page coverage. Details of the plan have not been thoroughly checked yet, but the consensus is that certain of the students' concepts deserve serious study by Wilmington city planners and administrators.

Educator Brennan has been giving his civil engineering planning course for three years now. Other of his classes have considered a new harbor installation in Chesapeake Bay, a steel mill on the Delaware River and a cement manufacturing plant in nearby Pennsylvania.

At Johns Hopkins, Abel Wolman, head of the Department of Sanitary Engineering and Water Resources, has for a number of years assigned similar broad-scale questions to advanced students who then function as practicing consulting engineers. His primary purpose is to introduce the students to successful procedures in analyzing an engineering problem which might be appropriate to a client.

Wolman's advanced seminar group spends an entire year on a single project. Its latest undertaking is a plan to finance major extensions to a water system.

Nine students analyzed revenue producing means in general, and applied their conclusions to a proposed Greater Baltimore Water Authority. (Interestingly, the students called for a three-prong financing procedure: water charges to cover operation and maintenance of the system, ad valorem taxes to pay for overall system improvements and special front-foot assessments to cover "local" improvements.)

Topics covered in earlier years include the Potomac River Drainage Basin, An Industrial Water Supply for the South Baltimore Area and A Study of Sludge Disposal Works.

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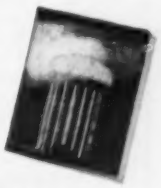

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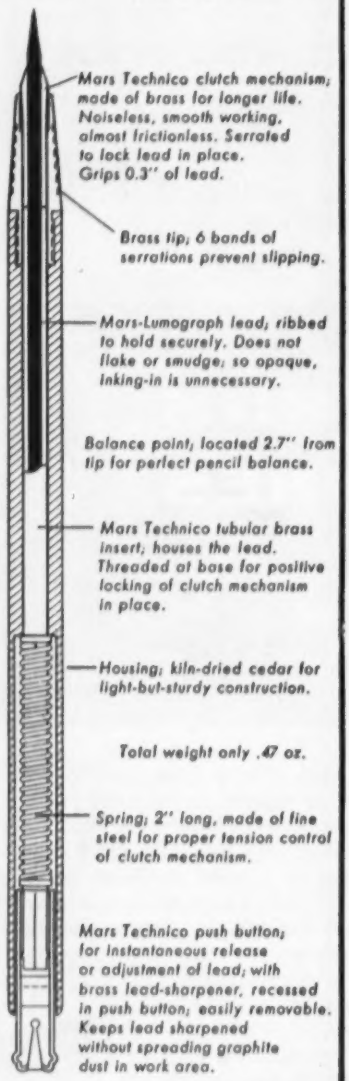

Mars Technico clutch mechanism; made of brass for longer life. Noiseless, smooth working, almost frictionless. Serrated to lock lead in place. Grips 0.3" of lead.

Brass tip; 6 bands of serrations prevent slipping.

Mars-Lumograph lead; ribbed to hold securely. Does not flake or smudge; so opaque, inking-in is unnecessary.

Balance point; located 2.7" from tip for perfect pencil balance.

Mars Technico tubular brass insert; houses the lead. Threaded at base for positive locking of clutch mechanism in place.

Housing; kiln-dried cedar for light-but-sturdy construction.

Total weight only .47 oz.

Spring; 2" long, made of fine steel for proper tension control of clutch mechanism.

Mars Technico push button; for instantaneous release or adjustment of lead; with brass lead-sharpener, recessed in push button; easily removable. Keeps lead sharpened without spreading graphite dust in work area.

Mars-Lumograph lead, finest graphite meticulously graded from 6XB to 9H (18 degrees) for better reproduction

Unique brass cap at top, prevents lead from falling out when clutch mechanism is released.

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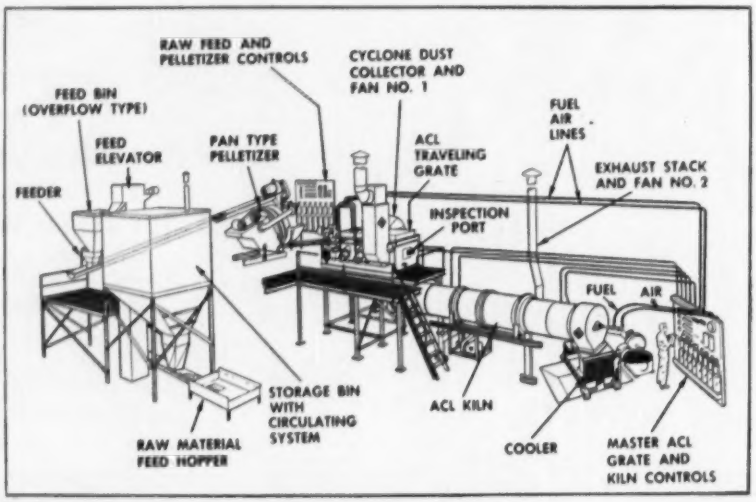


Big changes in cement making with this . . .

Cheaper, Smaller, Cleaner Cement Plant

Allis-Chalmers Manufacturing Co. has introduced a pilot model of a cement plant that it believes will mean big changes in the manufacture of cement.

The pilot model is a miniature of plants now being fabricated—one for Marquette Cement Manufacturing Co., Milwaukee, and the other to be set up for Diamond Portland Cement Co.

The following features, listed by Allis-Chalmers, make the new system superior to present conventional operations:

- Dust put into the air is kept at a minimum.
- Fuel costs for operation will be less than conventional units.
- A full-size plant will take up only about 60% of the space of present units in the U. S.

The pilot plant is located at the A-C Heat Processing Laboratory, Carrollville, Wis., a Milwaukee suburb. It uses what is known as the ACL (Allis-Chalmers Lellep) traveling-grate process. The company and O. G. Lellep, who has been a consultant with the firm for about six years, collaborated in the development of the new plant.

• **Three-part system**—Briefly, the system consists of three parts: pan-type pelletizing operation; a traveling grate used for drying and partly burning the pellets; and a full-scale short kiln that ranges from 120 ft to 175 ft in length.

Conventional wet and dry manufacturing processes are carried out in kilns 300 to 500 ft in length—the ACL unit, however, will be well under that. The ACL traveling grate will add a maximum of 85 ft in length to the ACL short kiln.

In the new process, the raw mix of clay and limestone is rotated as water is added, forming pellets ¼ to ¾ in. in size. The pellets remain uniform, while in other methods the heated raw materials tend to form clinkers of much larger size.

Because of uniformity of pellet size, more even burning takes place in the new process. Dust recovery, as the result of a double pass of gases through the pellet bed, means well-cleaned expelled gases.

• **Cost savings are considerable**—Allis-Chalmers notes that dust so recovered in an installation producing 4,000 bbl of cement a day should save $10,000 to $30,000 a year; and fuel savings for the same size plant should amount to between $120,000 and $250,000 a year, compared with conventional kilns.

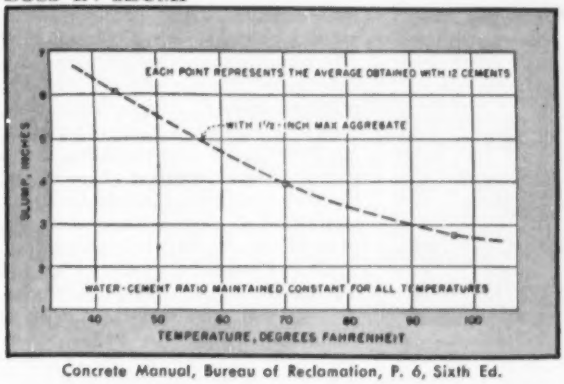
The final stage in the process, as in conventional operations, is grinding the resulting clinkers into finished cement.

Besides being used for this new process, the pilot plant will also be used for testing, demonstrating and developing untried raw materials and new techniques in the manufacture of cement.

Why Should HOT WEATHER CONCRETE Concern You?

... because HOT WEATHER CONCRETE sets more quickly, has lower ultimate strength, cracks more, and requires more mixing water than concrete made at cooler temperatures. In addition to structural deficiencies, HOT WEATHER poses problems with placing, compacting, and finishing.

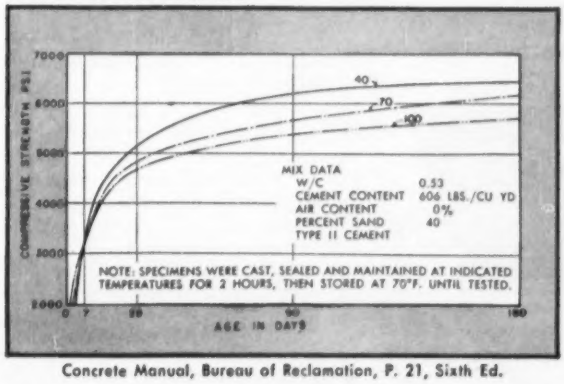
LOSS IN SLUMP



Concrete Manual, Bureau of Reclamation, P. 6, Sixth Ed.

This graph illustrates the loss in slump due to hot weather. Notice the 4" loss between 40°F and 100°F. Normally this loss in slump is overcome by adding more water to the mix. The result – more cracking and lower ultimate strength.

LOSS IN STRENGTH



Concrete Manual, Bureau of Reclamation, P. 21, Sixth Ed.

Even when no extra water is added to concrete in hot weather, strength will go down. Notice the 800 psi loss in strength at ninety days between concrete at 40°F and 100°F.

WHY TEMPERATURE AFFECTS CONCRETE – A cement gel forms around each grain of cement in the initial stage of mixing. The gel is large in hot weather and relatively small in cold weather. A large gel requires more water. Thus, the gel size governs the water requirement and ultimate quality. Gel size can be controlled . . . physically, by cooling the mix with ice . . . chemically, by controlling the mix with an exclusive gel-reducing agent . . . PLASTIMENT.

RETARDED SET – When the cement gel is reduced in size chemically, the setting time will be retarded in proportion to the quantity of Plastiment which is added. Thus a simple specification based on temperature and varying quantities of Plastiment will provide for uniform setting time and water requirement at all job temperatures. This chemical control will result in the high ultimate strength and reduced cracking that is obtained with cooled concrete.

BLEEDING ACTION – With the chemically controlled cement gel there is a unique type of bleeding action. Field men will notice a rapid release of clean, clear mixing water without scum or laitance after the concrete has been placed. In a wet mix this effect is very noticeable and serves as a "safety valve" by releasing the excess water and thus lowering the water cement ratio of the concrete in place.

PLASTIMENT ACTION – Plastiment's action is uniform and predictable. It may be added as a powder or liquid to an established mix or included in the original mix design. It does not entrain air and so may be added in variable quantities to suit the job conditions. Plastiment works only on the cement gel and therefore may be used in any type of plain or air entrained concrete.

CONCLUSION

Hot weather concrete can be controlled chemically to give uniform high quality and normal setting time through the use of varying proportions of Plastiment. Write today for Sika's *all-temperature concrete specification.*

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Men and Jobs

Wyoming Highway Department Reorganizes Top Personnel

Thurman D. Sherard, administrative assistant of the Wyoming Highway Department, has been promoted to the new position of Deputy State Highway Engineer.

Creation of the new post is part of a reorganization program designed to prepare the department for expanded requirements of the proposed interstate highway plan. Reorganization also calls for separation of the department's construction and maintenance sections. Ross G. Stapp, former construction and maintenance engineer, has been made state construction engineer. And William E. Sutton, former assistant construction and maintenance engineer, has been appointed state maintenance engineer.

Sherard started his career with the department in 1936 in the planning division and worked up to assistant planning engineer. In 1950 he was appointed secretary to the commission and public relations engineer. During World War II he worked with Army Engineers on construction of defense facilities and with Bureau of Public Roads on the Alcan Highway.

Road Engineer Starts Work On New AASHO Test Project

Walter B. McKendrick Jr., former chief engineer of the Delaware State Highway Department, is now on the job at Ottawa, Ill., as project director for the new test road sponsored by the American Association of State Highway Officials.

The $12-million test road is the third major effort in recent years to determine the effect of vehicle weights on roadways and bridge sections. It will take two construction seasons to complete the 8-mi project, then two years of testing and a fifth year for analyzing and writing the final reports (ENR Mar. 15, p. 26).

McKendrick joined the Delaware Highway Department in 1936 following graduation as a civil engineer from the University of Delaware. He took a year's leave of absence from 1939 to 1940 to attend a course in traffic engineering at Yale University under a Sloan Fellowship. In 1940 he returned to the department and set up its traffic and planning division. He became assistant chief engineer in 1943 and chief engineer in 1955. And during 1953 he served as chief engineer of the $46-million Delaware Memorial Bridge.

During the year McKendrick served as chief engineer of the road department, he developed a $17-million highway construction program for the present biennium. In addition, he inaugurated the dirt road improvement program authorized by this year's session of the legislature.

Three Men Named to Run New Photogrammetry Unit

A photogrammetry unit has been set up by the California State Division of Highways to develop a statewide photogrammetric program.

L. L. Funk, former assistant district engineer in San Luis Obispo, has been named to head the unit. His work in using and adapting photogrammetric techniques has won nationwide acclaim for the Highway Division. R. H. Fulton, senior highway engineer will be his assistant. Ralph Lejonhud, planning engineer in San Diego, has been named to Funk's former position.

Ambrose Burton Elected President of Aberthaw

Ambrose Burton has been elected president of the Aberthaw Construction Co., of Boston, specialists in industrial, institutional and commercial construction.

Burton will continue to hold his present post as vice president in charge of engineering for the industrial development firm of Cabot, Cabot & Forbes, which purchased Aberthaw last year (ENR Oct. 13, '55, p. 45).

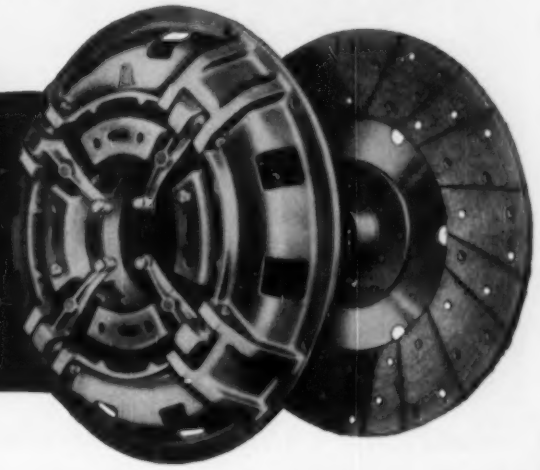
A graduate of the School of Engineering at Tufts University, Burton is a member of the NSPE.

(*Men and Jobs continued on page 78*)

Ambrose Burton

You Get FULL TORQUE CAPACITY For Entire Life of Friction Material...

Lipe **Constant Capacity CLUTCH**



Just as long as there's the least bit of wearing surface left on the friction material, the Lipe Constant-Capacity Clutch maintains its torque capacity. A unique application of the toggle principle automatically compensates for friction material wear. The constantly increasing leverage of the toggle —which never goes over center—builds up pressure in almost direct ratio to friction material losses and compensates for fading pressure of expanding springs.

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PARALLEL CONTACT— because arrangement of the toggles assures a uniform pressure application pattern. Every square inch of facing area engages simultaneously, preventing highly concentrated heat areas and spot burning.

LIPE Constant-Capacity CLUTCH

- Engages firmly and smoothly
- Automatically compensates for wear of friction material
- Automatically compensates for fading pressure due to spring expansion and fatigue
- Balanced spring pressure through toggles maintains parallelism of pressure plate
- High thermal efficiency dissipates heat rapidly
- Internal cooling protects springs from overheating and loss of temper
- Automatically compensated pressure needs no adjustment

NO SERVICING— because these self-compensating, non-adjustable clutches insure automatic internal adjustment throughout the life of the clutch facings.

SOFT ENGAGEMENT— because the toggles absorb the initial energy of the springs . . . and because the speed of the toggle action fades as the pressure plate approaches the friction element.

HIGH THERMAL EFFICIENCY— because the massive plate, ribbed for rapid radiation, is cooled by generated air currents.

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Waterproofing approach walls Patapsco Tunnel between Baltimore and Brooklyn, Md. Waterproofing by Anchor Waterproofing Corp., New York City and Railroad Waterproofing Corp., Lynbrook, N. Y. joint venture.

"Karnak completely waterproof... never known to deteriorate."

That's what George Knight, superintendent of waterproofing for Patapsco Tunnel, says. He adds, "Karnak waterproofing mesh is one of the easiest-to-handle waterproofing materials . . . light-weight, durable and long-lasting . . . I've never known it to deteriorate, crack, or fail to do the job."

Karnak is the open-mesh, asphalt-saturated cotton cloth that's layered on the job with alternate moppings of highly refined, ductile asphalt. The open mesh allows the mopping asphalt to penetrate and interlock the layers, providing a firm membrane that maintains water proofing through the life of the structure. Karnak fabric is also available in tar and pitch saturation.

Karnak has met tough waterproofing requirements for over 30 years on dams, tunnels, bridges, swimming pools, viaducts and building foundations. Specify Karnak on your next waterproofing job. **Manufactured by Lewis Asphalt Engineering Corp., 30 Church Street, New York 7, N. Y. Dept. 212.**

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. . . Men and Jobs

Appoint City Engineer For Delaware Capital

Robert D. Bewick, of Dover, has been appointed as city engineer for that city, the capital of Delaware.

A graduate of the University of West Virginia in 1952, Bewick has been with the plans and design division of the Delaware Highway Department since August of 1952.

Men and Jobs Briefs . . .

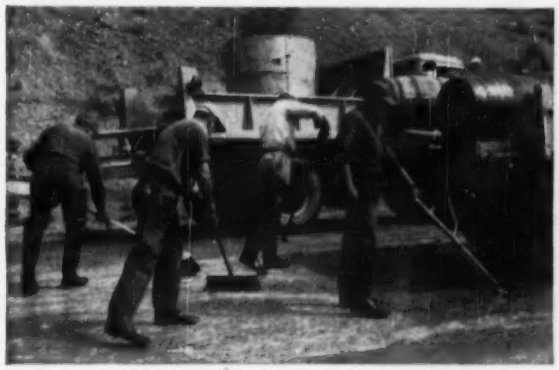
• **Associations**—The American Society of Refrigerating Engineers elects as president **Carlyle M. Ashley,** chief staff engineer of the Carrier Corp., Syracuse, N. Y. . . . **Robert Davis,** superintendent of public works at Covington, Ky., is named president of the Kentucky chapter of the American Public Works Assn. . . . The Metropolitan Section of the ASCE elects **David G. Baillie, Jr.,** as president, and the Delaware Section of the society names **Ernest S. VanDemark** as president . . . **Burnham S. Colburn Jr.,** consulting engineer of Asheville, N. C., is elected president of the newly organized Professional Engineers Club of Western North Carolina.

• **Careers**—U. S. Bureau of Reclamation promotes **Louis G. Puls** to assistant chief designing engineer for the civil and structural division, **Edward R. Dexter** to assistant chief of the dams branch, and **G. Vernon Becker** to assistant chief of the structural and architectural branch . . . Ahoskie, N. C., names **Robert E. Selden** of Raleigh, civil engineer with the North Carolina State adjutant general's office, city public works director . . . **Gaither H. Sykes,** retired construction management engineer for the Department of the Army, is appointed assistant city engineer for Frederick, Md.

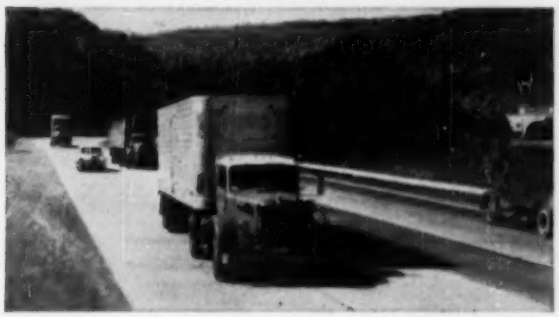
• **Business**—The firm of architect Linn Smith, A.I.A., announces the expansion and incorporation of this firm into a new organization called **Smith, Tarapata, MacMahon, Inc., Architects,** located in Birmingham, Mich. . . . **Alfred C. Leonard** is appointed an associate in the firm of Malcolm Pirnie Engineers, New York City consultants . . . The consulting engineer firm of Michael Baker, Jr., Inc., located in Rochester, Pa., announces the appointments of **Don H. Graham** of Beaver, Pa., **Wayne D. Meyers** of Camp Hill, Pa., and **Frederick H. Awalt** of Washington, D. C., as vice presidents of the firm.

FINISHING THIN LAYERS OF CONCRETE RESURFACING, 24′ wide, without troweling or tearing, was accomplished with this Jaeger-Lakewood vibratory finisher. Only the front screed was used. Screed is of "bullnose" type, carrying 5 vibratory motors. Three finishing passes were made, using a different vibratory action for each pass.

Six sections (two each of ½″, 1″ and 2″ thickness) plus transition sections, were laid. Only the 2″ sections were mesh reinforced. Concrete was designed for each section so that aggregates did not exceed 50% of course thickness. Water did not exceed 5 gallons per sack of cement.



PREPARATORY TREATMENT OF OLD SURFACE: Slab was first scarified, scrubbed with detergent and etched with dilute muriatic acid to remove all scale and oil drippings. A ¼″ bonding layer of cement-sand grout was then applied to the cleaned surface.



7 DAYS LATER, the resurfaced section was opened to the flow of Turnpike traffic.

Turnpike gets first thin concrete resurfacing with Jaeger vibratory finisher

FIRST experimental application of thin concrete resurfacing on a highway is on a 730′ section of the Pennsylvania Turnpike, just east of Allegheny Tunnel. The job of finishing the thin (½″ to 2″) layers of dry material was successfully handled by a standard Jaeger-Lakewood finishing machine, equipped with a Jaeger "bullnose" vibratory front screed.

The development of the concrete finishing machine and the concrete spreader, the bullnose vibratory screed, the diagonal rear screed on finishers and the oscillating metering screed on concrete spreaders—all these are Jaeger-Lakewood contributions to modern paving practice. For their application to your work, see your Jaeger distributor or send for Catalog.

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In addition, specific fuel consumption on a horsepower per hour basis will be far less. Sea level performance will be restored within operating limits at altitude, response to acceleration demands will be rapid and excessive smoking under operating power eliminated. Also, the noise level will be greatly reduced.

Application in other fields will be equally effective, as has already been demonstrated in the remarkable results achieved by the installation of AiResearch Turbochargers on Caterpillar diesel machinery.

AiResearch is the largest producer of small turbomachinery in the United States, with twenty-five *million* hours of experience. This unmatched experience explains why AiResearch Turbochargers lead in power, economy and dependability.
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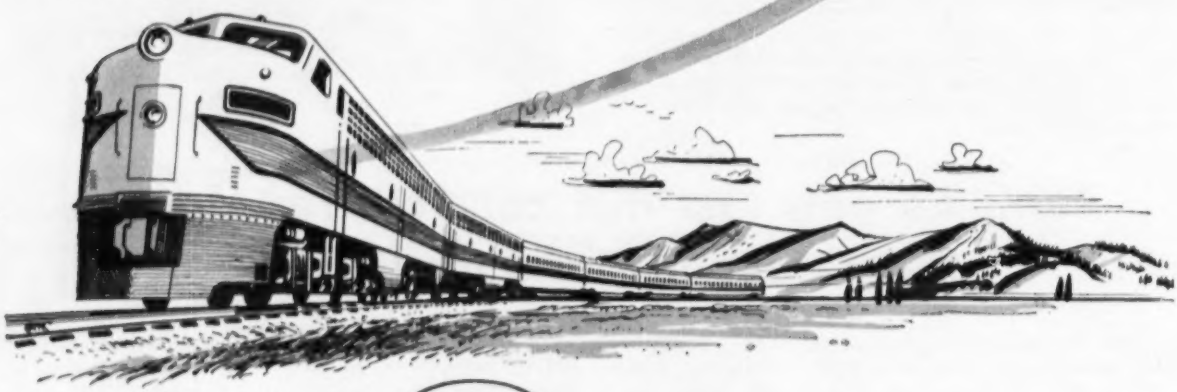

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Obituaries

Edward Nathan Prouty, 88, chief design engineer for the C. C. Kennedy engineering firm in San Francisco, died May 21 in Berkeley. Following his graduation from the University of California in 1899, Mr. Prouty taught in the school's civil engineering department. He later was project engineer for the Southern Pacific, and headed the job of double tracking the railroad's route over the Sierras. He retired three years ago from the Kennedy firm after 33 years of service.

Samuel G. Neff, 57, construction and operations chief of the North Pacific Division, Corps of Engineers, died May 17 in Glasgow, Mont., while on an inspection tour of construction projects. Mr. Neff had been resident engineer at McNary Dam on the Columbia River during the crucial years of its construction. He had also supervised the hydraulic-fill construction of Fort Peck Dam. He was a graduate of the University of Wyoming.

Robert W. Pommerer, 76, died in Prattsville, N. Y., where he had lived in retirement since 1947. He had been a resident engineer for the Board of Water Supply of New York City. A 1901 graduate of Manhattan College, Mr. Pommerer had worked for years with Alcoa in Dutch Guiana and Malaya.

C. Glen Smith, who retired in 1953 as city engineer at Puyallup, Wash., died May 22. A civil engineer graduate of the University of Colorado, he served as King County Engineer in 1947.

Harry E. Coverston, who had been construction superintendent for a number of firms and had worked much abroad, died recently at his home in Ft. Myers, Fla. Mr. Coverston recently returned from work on Spanish Air Depots, and was a former Florida Highway Department engineer.

Harold E. Simpton, 68, president of Phoenix-Simpton, general contracting firm of San Francisco, died May 31. A native of National City, Calif., he headed the firm since its inception in 1912.

William P. Doran, 85, former New York State Superintendent of Canals, died May 30 at Buffalo. A graduate of Georgetown University, he was superintendent of canals in the early 1930's.

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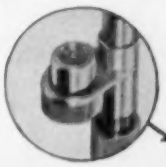

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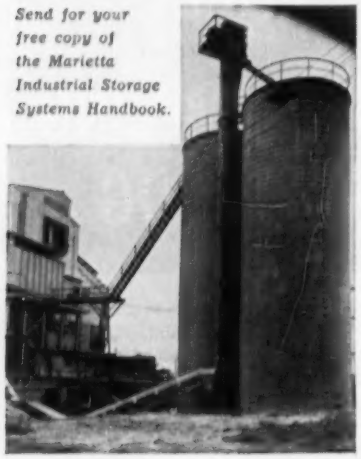

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Sub Recovers From Owner After General's Default

An agreement by an owner to pay a subcontractor for finishing a job after the default of the prime contractor is valid and enforceable.

Last year, for example, a case arose in the District of Columbia involving a job on which the prime contractor had defaulted. The electrical subcontractor could have stopped work, but he agreed with the owner, instead, to finish his work and to look to the owner rather than the general for payment.[1]

In permitting the sub to recover from the owner, the court said:

"The same situation arose in Shisler v. Moore, 3 Cir., 19 F. 2d 991. A subcontractor had stopped work, and the owner promised that if he would resume and finish the job, he, the owner, would pay for the after-done work. The court held that this was a promise by the owner to pay his own debt and not the antecedent debt of the contractor, and that such promise was enforceable, although not in writing. We made the same ruling in a similar building case, where the claim was based on the personal promise of the owner to pay his own debt and not that of another. Jones v. Guice, D.C., Mun. App., 57 A. 2d 190, 191."

(1) Thomas v. Ehrmantraut, 111 A. 2d 623, Municipal Court of Appeals, District of Columbia, Feb. 15, 1955.

Computation of Damages For Breach of Contract

If a contract is breached before the contractor starts a job, the contractor can recover the contract price less the cost of doing the work. Where the work had been partially completed, the contractor, in proving his damages, should substantiate his claim by proof of actual expenditures.

Here are two illustrations:

(1) In a Georgia case, the contract was for air conditioning of a building. The owner, however, refused to permit the contractor to proceed with the work and the latter brought an action[1] to recover damages for breach of contract.

The court held that where one employs another to furnish the labor and materials required for the improvement of real estate and then renounces the contract prior to the time the contractor starts the work, the contractor is entitled to recover as damages the difference between the contract price and what it would have cost the contractor to perform the job.

(2) In another case, where an action was brought to recover damages for breach of contract, the court[2] held that it was improper to prove such damages by offering in evidence a detailed statement of the cost of the work which was prepared for use at the trial when such statement was not substantiated by checks, vouchers, payrolls or other definite proof of actual expenditures.

(1) Luckie v. Wright, Inc., 82 S.E. 2d 660, Court of Appeals of Georgia, May 13, 1954.
(2) Zemp Const. Co. v. Harmon Bros. Const. Co., 82 S.E. 2d 531, Supreme Court of South Carolina, June 2, 1954.

Written Contract Stands Despite Oral Agreement

Oral agreements supplementing written contracts may be unenforceable for at least two reasons: there may be no new consideration to support the new agreement, and the written contract may provide it can't be altered except in writing. Furthermore, state laws usually contain strict provisions on this point.

All these arguments were invoked to defeat an action started in New York by buyers of a new cooperative apartment house. The corporate builder had sold stock in the corporation entitling the purchasers to apartments when the building was completed. The contract provided that "that the building is to be deemed completed, for the purposes of the contract, as soon as the final certificate of occupancy has been issued by the department of housing and buildings of the City of New York, the final payment on the building loan mortgage made, and the mortgage assigned to the Mutual Benefit Life Insurance Company for permanent financing." These three conditions had been complied with.

The contract also contained a provision to the effect that "no change or modification of the terms and conditions of this agreement shall be binding on the sellers unless the same shall be in writing, signed by Sam Minskoff on behalf of the sellers."

The buyers brought an action against the sellers to revover damages resulting from the breach of an alleged oral contract whereby the sellers agreed that they "would do everything necessary to fully and properly complete the building and furnish the necessary equipment in accordance with the intentions of the defendants and Sam Minskoff and their agreement to provide a complete and well fur-

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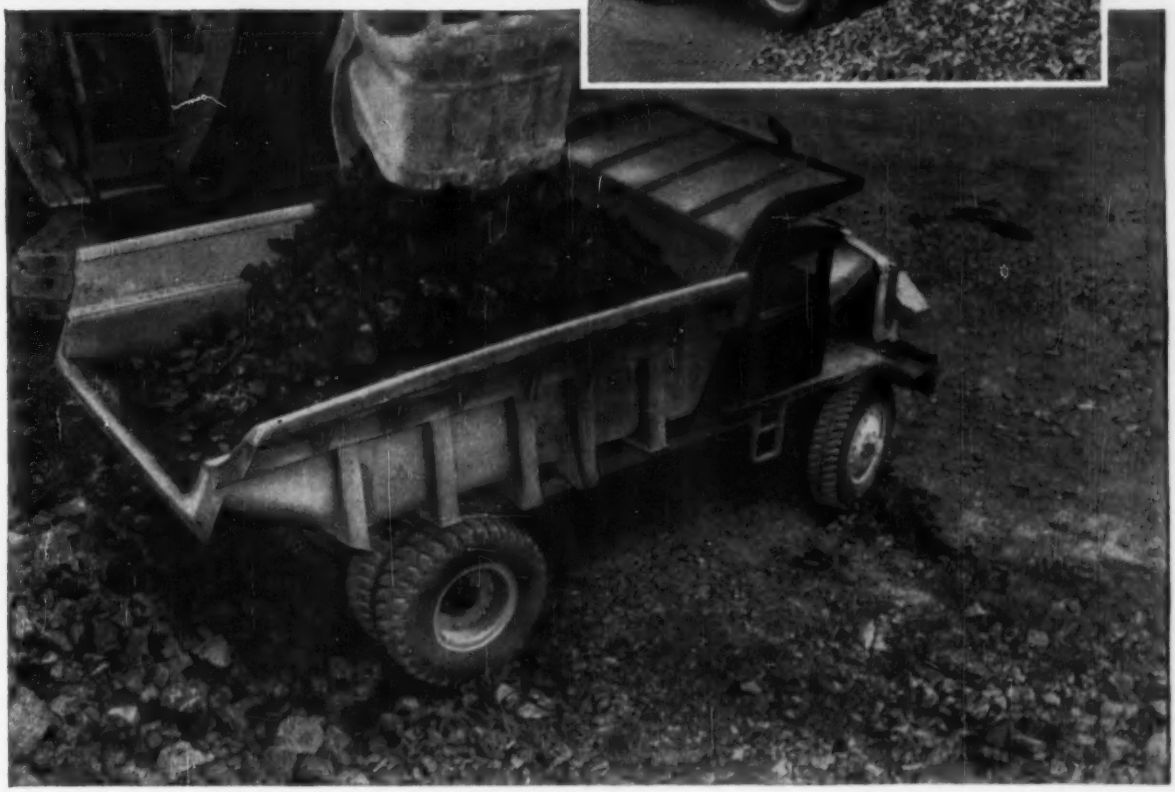

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nished building, in accordance with the plan of the organization."

The case was dismissed. The court said "The purpose of inserting this provision in accordance with the statute is clear. If it were possible to eliminate the objective test of completion contained in the contract by proving an oral promise to finish what the contract stated must conclusively be presumed to have been finished, there would have been little purpose in incorporating such a test in the contract. Likewise, no consideration has been shown for a new promise to perform work upon the building. Only certain agreements made in writing are validated without consideration by section 33 of the Personal Property Law, McK. Consol. Laws, c. 41. This agreement is alleged to have been made orally. Consideration is necessary to support promises of this nature. Schlegel Mfg. Co. v. Peter Cooper's Glue Factory, 231 N. Y. 459, 132 N.E.148, 24 A.L.R. 1348."[1]

The section of the Personal Property Law referred to provides, in substance, that a written contract or other written instrument cannot be changed orally when it contains a provision stating that changes can only be made in writing and signed by the party against whom enforcement of the change, or modification or discharge is sought.

(1) 20 East 74th Street, Inc. v. Minskoff, 308 N. Y. 407, 126 N.E.2d 532, Court of Appeals of N.T., April 14, 1955.

Court Disallows Commission On Getting Government Work

An agreement to obtain a government contract for another on a contingent fee basis is illegal and unenforceable.

The point was recently raised by an agent who sued a contractor for commissions he said were due under a contract for procuring government work.

The contractor disclaimed liability on the grounds that the agreement was illegal under the Executive Order requiring government procurement contracts to contain a warranty that the contractor has not employed any person to secure the contracts on any agreement for a contingent fee. The agent was granted a judgment by the trial court but the judgment was reversed on appeal,[1] the appellate court holding that the contingent fee contract was unenforceable because it was in violation of the Executive Order.

The appellate court stated: "The policy of the law which prohibits contingent fees for services rendered in securing favor legislation is not concerned with the moral or ethical standards of clients served. The purpose of the law is to prevent improper pressures upon legislative action. The fact that a client may be one of such low moral and ethical standards as to take advantage of his agent, certainly constitutes no reason for permitting his agent to take advantage of the government."

The statute also contained the following provision: "This warranty shall not apply to commissions payable by contractors upon contracts or sales secured or made through bona fide established commercial or selling agencies maintained by the contractor for the purpose of securing business." The appellate court held that the evidence did not support a finding that the agent came within the exception.

(1) Le John Manufacturing Co. v. Webb, 222 F. 2d 48, U. S. Court of Appeals, District of Columbia, April 1955.

Substantial Performance Has No Definite Formula

Substantial performance is a question of degree and depends upon the circumstances of each case.

An Alabama court, for example, allowed the contractor a recovery where the completed building contained no material defects and where the owner had assumed possession and occupancy, both an implied acceptance of the work.

"The question of substantial performance", the court observed, "should be determined in each case with reference to the existing facts and circumstances of the case. Substantial performance does not contemplate a full or exact performance in every slight or unimportant detail but performance of all important parts. Gray v. Wood, 220 Ala. 587, 127 So. 148: Alexander v. Smith, 3 Ala. App. 501, 57 So. 104."[1]

(1) Miles v. Moore, 79 So. 2d 432, Supreme Court of Alabama, April 7, 1955.

It May Be the Jury's Job To Interpret a Contract

It is sometimes up to the court to determine what a written contract means. At other times, it is a question of fact for the jury to decide.

An Illinois court[1] has summed up the problem this way: "The meaning of a written contract is ordinarily a question of law for the court and not one of the fact for the jury, but if the construction depends not only upon the meaning of the words employed, but upon extrinsic facts and

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Power where it's needed

Tournapull's electrical control system puts the power right where it's needed, with minimum friction loss. Dependable motors are unaffected by weather conditions. Operation is by dashboard push-buttons . . . action is instantaneous. Maintenance is simple.

Shorter turns

Despite its size, "B" maneuvers in closer quarters than any other big, self-propelled scraper. This machine can turn around in a space only 35' wide. Machine is power steered . . . easy to handle anywhere . . . maneuvers safely in rough going, at high speed.

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Start work earlier . . . stop less often due to rain . . . add work-time at end of season with "B's" high tractive ability. Power-transfer differential transfers pull to wheel on firmest footing . . . "walks" "B" out of soft spots. Big, low-pressure tires give good traction in soft going. Rain and dust do not bother electrical system.

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A 35-ton Rear Dump is available for use with the same "B" prime-mover. You can switch this 35-ton hauling unit anytime job conditions call for shovel or dragline loading. This way you get insurance of continuous earnings . . . double value from your investment.

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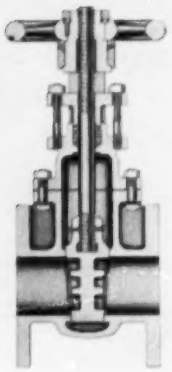

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circumstances, or upon the construction which the parties themselves have placed upon the contract, which is to be proved like any other fact, if such facts are controverted, the inference to be drawn is for the jury, and in such case the whole question as to what the contract was should be submitted to the jury under proper instructions."[2]

Quoting from another case,[3] the court stated: "It is true that where the construction of a written contract depends, not only upon the meaning of the words employed, but also upon extrinsic facts or the construction which the parties themselves have placed upon it, which is to be proved as any other fact, if the facts so proved are controverted then the question as to what the contract was is a mixed one of law and fact, to be submitted to the jury."

(1) Du Hamel v. Board of Education of C.U. School Dist. No. 1,130 N.E. 2d 10, Appellate Court of Illinois, Oct. 19, 1955.
(2) Turner v. Osgood Art Colortype Co., 223 Ill. 629, 635, 79 N.E. 306, 308.
(3) Carstens Packing Co. v. Sterne & Son Co., 286 Ill. 355, 357, 121 N.E. 737, 739.

Sub Recovers From Surety Before Final Payment Made

A surety bond may be so written that a subcontractor can recover against the surety for work done, even though the work of the general contractor has not been accepted nor final payment made.

This was the situation in an Arkansas case, where the surety bond guaranteed both the performance of the general contract and the payment of money due subcontractors.

A sub sued the surety for the balance due it, claiming that the work which it had performed had been accepted and used by the city for which the work was done.

In its defense, the surety said the prime contractor's work had not been accepted and that there was still pending an action by the contractor, to whom final payment had not been made, for the balance due under the contract. The surety asked that the suit be dismissed, or that the prime contractor be made a party to the action.

The subcontractor was granted a recovery,[1] the court holding that under the provisions of the bond, it was not necessary to make the prime contractor a party to the action. Another defense interposed by the surety was that the general contract provided that the general contractor would not be entitled to final payment until the final inspection and acceptance of the work. The subcontract incorporated

Trimming back banks, 2½-yard shovel loads Rear-Dumps with 9 to 10 tons of granite and dirt, in an average of three passes. Loading time in this rocky going: about 1 minute 50 seconds.

"Can't be beat for work in cramped quarters," says supt. on mountain road job

To relocate four miles of dangerous, winding, one-way highway through the Sierra Nevada mountains in western California, Ball & Simpson, Berkeley, moved about 800,000 cubic yards of granite.

This job required sturdy haul equipment that would move rock fast during the summer months before snow closed roads for the winter. To handle this work, company drove in three, sure-footed, 28 mph D Tournapull Rear-Dumps.

Work faster on mountain roads

Tournapulls' 90° turning ability, provided by instant-acting, easy-to-operate power steer, enabled these Rear-Dumps to spot for load and dump faster and more safely than could a conventional dump-truck.

Giant multi-disc four-wheel air brakes, with more brake surface on one wheel than most haulers have on all four, gave operators confidence to use Tournapulls' top speeds on steep, narrow mountain grades.

Says Operator Gordon D. Wood, "These Tournapull Rear-Dumps have good brakes that you can depend on to stop *right now*. Machines are easy to handle, too. They certainly get around good in narrow spots."

Because of Tournapull's advantages, each Rear-Dump was able to average 1000′ cycles in 4 minutes 10 seconds.

Superintendent E. E. Frost, said that, in the best production he could recall, each of the three Rear-Dumps hauled 200 loads 300′ down a steep grade, during one 10-hour day.

He describes this relocation job on the Sonora Pass Road as one of the toughest examples of rock road work he had ever seen. "Tournapull Rear-Dumps can't be beat. They are a wonderful piece of equipment for this type of work. Tournapulls run in and get under a shovel so much easier than a truck!"

No major repairs in 3 years

During three seasons in the Sierra Nevada mountains, machines have experienced very little downtime, needed no major repairs. Although the three "D's" have been used more than 2500 hours each, original tires are still in good condition.

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Tournapull dumps in ½ minute, including time maneuvering to edge of bank. "They're fast dumpers" says Operator Gordon D. Wood. Working a 58-hour week, Tournapulls hauled 75% of the material in this road relocation. Balance was moved by 2 crawler-scraper combinations and 2 crawler-dozers.

Rear-Dumps hauled granite-fill for relocation of 4 miles of mountain highway. The new, modern, two-way road, built under the direction of the Bureau of Public Roads, eliminates a narrow winding section of the Sonora Pass Road (State Route 108), between Dardanelle and Strawberry.

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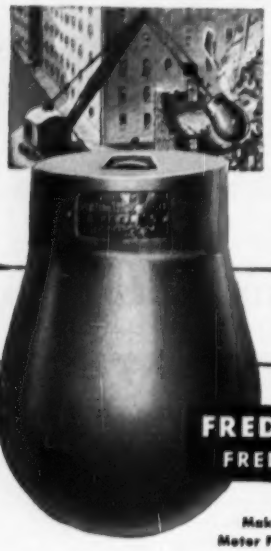

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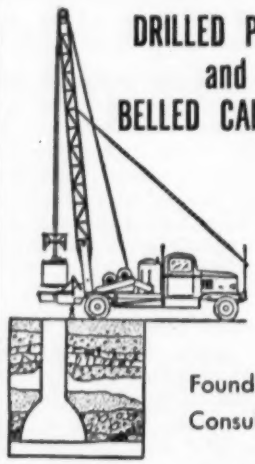

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the provisions of the general contract by reference. The court held that such provision of the contract did not constitute a waiver of the right of the subcontractor to recover the balance due him under his subcontract when the work done by him fulfilled the terms of the subcontract.

(1) Trinity Universal Insurance Co. v. Smithwick, 222 F. 2d 16, U.S. Court of Appeals, Arkansas, May 2, 1955.

Recovers Loss of Profits For a Breach of Contract

For the purposes of damages for breach of contract, the contract should be considered in its entirety, and any schedule of payments contained in the contract should be disregarded. The contractor is ordinarily entitled to a sum equal to the amount of profits lost.

In a Nevada case, a contractor had started work but the owner prevented him from finishing the job. The contract had called for payment of 80% of the contract price on completion of the rough-in wiring and the balance on completion of the work. The breach had occurred after the rough-in wiring was done, and the principal question was whether the 80% provision limited the recovery.

Referring to the situation as a total breach of contract[1], the court said the proper measure of damages was the total contract price less the amount it would cost to complete the job. The contract provisions as to the schedule of payments should be disregarded.

(1) Fuller v. United Electric Co., 273 p. 2d 136, Supreme Court of Nevada, July 15, 1954.

Contract Induced by Fraud May Be Affirmed or Voided

The rule is elementary that fraud in the inducement of a contract renders the transaction only voidable and not void, and therefore the injured party may elect either to affirm the contract and sue for the damages sustained or he may rescind the contract and recover for the work done on the basis of fair and reasonable value.

The measure of damages in an action for fraud and deceit is the difference between the amount paid and the value of that which the injured party receives.[1]

(1) Schlenoff v. Kroll, 141 N.Y.S. 2d 370 and numerous cases and authorities there cited.

(These summaries of court decisions are prepared by I. Vernon Werbin, New York attorney and civil engineer.)

Now... world's MOST POWERFUL and FASTEST push tractor...

with 416 HP and 4-wheel drive

The Twin-C Pusher

...to give you bigger loads in shorter loading time

One operator and this powerful "Twin-C" pushes your biggest production scrapers for capacity yardage. On many jobs it will do this in less time than it takes 2 crawler-pushers with 2 operators. Rubber-tired speed, and articulated steer, give quick maneuverability for direct-line push, save seconds in picking up next load.

Synchronized power matches speeds of earthmovers — Twin-C speeds match loading speeds of modern rubber-tired earthmovers, take advantage of combined power of loader and pusher to get big pay loads *fast*. Torque converter, teamed with constant-mesh transmission in both front and rear engines, reduce "lug downs" and gear changes necessary in many pushers.

More usable power with rubber pushing rubber — You get greater usable horsepower and coordinated pushing force when you push rubber with rubber. You get full floating traction... tire treads follow tire treads... no loss of power to flatten out rounded tire-tracks into flat track-tracks. And Twin-C's 80,000 lbs. weight rides on four big 29.5 x 29 tires with 22-ply rating; each 2'5" wide for firm ground-gripping traction on any type of surface.

Additional Twin-C advantages:

- Forward speeds to 20 mph and fast reverse, plus "articulated" steer, enable Twin C to position faster behind scrapers.
- Big 49½ x 88" heavy, concave push-bowl is positioned by an electric motor to take full advantage of contact area provided by scraper push-block.
- Push-button electric controls with instant response, the same type controls used on LeTourneau-Westinghouse scrapers for 8 years, give you positive power-steer and accurate push-plate-positioning.
- Power-transfer differentials on both engines match pull to traction, automatically apply power to wheels on firmest footing. Keep big pay-loads rolling in sand, mud, and loose materials.

If your fleet includes production scrapers, you will want more information on the Twin-C Pusher. Ask your LeTourneau-Westinghouse Distributor for full details.

65,900 lbs. Drawbar Pull! Powerful 416 hp Twin-C Pusher push-loads scraper fast. In recent Dynamometer tests, Twin-C, operating in sandy clay footing, registered drawbar pull of 65,900 lbs. in low-speed range.

Twin-C—Trademark TW-1039-G-b

LeTourneau-WESTINGHOUSE Company

Peoria, Illinois

A Subsidiary of Westinghouse Air Brake Company

Grousers: available in regular, semi, or flat types; all standard widths

WHY

Kensington track

LASTS SO LONG

There are two reasons why these tracks give you longer service, even under severest working conditions: (1) KENSINGTON'S new, improved design, and (2) superior, wear-resisting alloyed manganese steel.

New Design. Rigidity and near-perfect alignment are made possible by one-piece rail design and special heat-treated alloy pins pressed tightly in place under high pressure. Anti-shear lugs on grouser plate fit snugly over tie bar of link to eliminate loose plates, elongated bolt holes, twisting, weaving, and side-sway ... the most common causes of bolt loosening and track trouble. Grousers are heavied-up at all critical points to better resist bending and breaking.

Yet, despite all these improvements, KENSINGTON *Track Assemblies fit all standard, popular make crawler tractors.*

Steel with Stamina. Special, hard, tough, KENSINGTON-developed alloyed manganese steels actually fight back against wear! They constantly develop extra surface hardness when exposed to friction, abrasion, and impact.

KENSINGTON tracks come from the factory ready-assembled, easy to install.

Discover for yourself how much KENSINGTON tracks will lower your maintenance costs and improve your operating efficiency. Coupon will bring details.

Kensington

STEEL COMPANY

SUBSIDIARY OF POOR & CO., CHICAGO

KENSINGTON STEEL CO.
Dept. E, 505 Kensington Ave., Chicago 28, Ill.

● Please send information on crawler tracks for tractor described below. I understand I will be under no obligation.

Make of tractor_____

Model_____ No. tracks per belt_____

Width of grouser_____

NAME_____

COMPANY_____

ADDRESS_____

CITY_____ ZONE_____

STATE_____

Unit Prices

Sand Solves Aggregate Problem on Arizona Highway

This seven miles of asphaltic paving job east of Holbrook, Ariz., will substitute fine sand for gravel aggregate which is not available in this area. Lacy C. Greer of Holbrook is consulting engineer for the Arizona State Highway Department in Phoenix, Ariz.

The $376,580 contract went to Fisher Contracting Company, Phoenix, whose bid was 13.1% below the second low bid and 17.7% below the engineer's estimate.

The design calls for a subbase of 4 in. to 13 in. and a 5-in. base laid in two courses. Plant mixed base and subbase must contain 4% of 150 to 200 penetration ashpalt. Approximately 80% of the fine sand has to pass No. 40 sieve and 5% to 15% No. 200 sieve.

The surface of ¾-in. plant mixed material includes crushed gravel and 5% asphalt. Crushed gravel will be shipped by rail from Phoenix or Prescott, Ariz., to a railhead seven miles from the site.

An additional 3-in. pavement can be placed if this should become necessary after several years of use.

The bidders are:

1C Fisher Contracting Co., Phoenix, Ariz	$310,063
2 B. L. Gustafson, Contr., Phoenix, Ariz	356,735
5 Phoenix-Tempe Stone Co., Phoenix, Ariz	427,918
EE Lacy C. Greer, Holbrook, Ariz	376,580

BIDS: 3-21-56 Items	Unit	Quantity	Unit Prices 1C	2
Water supply, provide	ls	job	$750.00	$750.00
Water, apply	Mgal	4,200	2.50	2.75
Roll	hr	1,200	8.40	8.00
Select Material	ip	t 68,800	0.50	0.50
Plant mix bit stabiz base, exc liquid asph	ip	t 43,250	2.00	2.75
Plant mix seal coat, exc liquid asph	ip	t 6,550	9.40	11.00
Paving asph for base & seal ct, grade penetr 150-200		t 2,390	43.00	44.00
Guide posts	ip	ea 165	6.80	5.50
Bit mix curbs	p	lf 24,900	0.10	0.15
gutters	p	lf 645	1.35	1.00

* ip—in place
Work to be started: 4-25-56. To be completed: 10-31-56.
Liquidated damages: Actual engineering costs after completion date.

Bargain Bids on Connecticut Water Main

At $107,900, for 21.3% below the engineer's estimate, this contract covers 5,260 lin ft of reinforced concrete water main with connections and appurtenances in Hartford and Wethersfield, Conn. Work is for the Water Bureau of the Metropolitan District in Hartford. Warren A. Gentner is deputy manager and chief engineer and Gilbert Gustafson is associate engineer of the Bureau. The contract price bid by P. DiMascio, Inc., Dorchester, Mass., was only 0.2% below the second low of twelve bids.

The owner furnishes gate valves and cast iron pipe.

The bidders include:

1C P. DiMascio, Inc., Dorchester, Mass	$107,900
2 DiMascio Bros. & Co., Quincy, Mass	108,095
12 Clark & Fry Const. Co., Bridgeport, Conn	175,525
EE Water Bureau of the Metropolitan Dist	137,055

Bids: 3-15-56 Items	Unit	Quantity	Unit Prices 1C	2
RCP, cylindric, 24" f&i	lf	5,040	$18.50	$19.00
CIP, 24", 20", 18" i	lf	11.00	15.00	
18", 12" i	lf	120	10.00	10.00
Excav, earth, below grade & outside limits of trench	cy	50	3.00	7.00
rock	cy	800	10.00	7.00
Gate valv, 20", 18", & bldg pits i	ea	6	350.00	300.00
12", 8" i	ea	4	320.00	300.00
8", in gate boxes i	ea	3	50.00	20.00
Air valve i	ea	9	30.00	25.00
Concrete mary	cy	10	30.00	20.00
Timber, ordered left i.p.	Mfbm	2	100.00	100.00

Work started: after March 29, 1956
To be completed: July 1, 1956
Liquidated damages: $150 per calendear day

Prestressed Concrete for Oklahoma Water Pipe

Prestressed concrete beat the cast iron alternate on this 56,883 lin ft of cross country water line for Vinita, Oklahoma. Lee M. Bush & Co. of Oklahoma City handled the design for this job.

The $851,181 contract awarded to A. B. C. Construction Co., Tulsa, Okla., is only 0.01% below the second low bid and 0.45% below the engineer's estimate. The low of two bids received on the cast iron alternate topped this contract price by 15%.

This 24-in. and 30-in. line of 150-lb pressure pipe to be laid through woods, rock and cultivated fields will have a capacity of 13 million gallons per day. It will replace an existing 12-in. cast iron pipe with a capacity of 1 million MGD.

Wage rates include $2.00 for skilled labor, $1.50 for semi-skilled and $1.00 for unskilled labor.

Bidders are:

1C A.B.C. Construction Co., Tulsa, Okla	$851,181
2 Wade Lahar Company, Tulsa, Okla	851,293
8 Torson Construction Co., Kansas City, Mo	1,096,500
EE Lee M. Bush & Co., Oklahoma City, Okla	855,000

Bids: 3-20-56 Items	Unit	Quantity	Unit Prices 1C	2
CIP, 24"	lf	23,500		
30"	lf	33,835		
CP, 24"	lf	23,500	$13.00	$12.60
30"	lf	33,835	15.20	15.50
Gate valve, 30"	ea	3	2,563	2,550
24"	ea	4	1,450	1,450
12"	ea	4	475.00	185.00
Check valve, 30"	ea	1	3,750	4,000
Air & Vacuum, 2"	ea	21	175.00	110.00
4"	ea	2	250.00	250.00
Blow-offs, 6"	ea	6	250.00	150.00
Concrete, 2,500/	cy	150	27.50	30.00
CIP, cl 150, 12"	lf	100	10.00	5.50
Cross sections	ea	4	475.00	837.50

Work to be started: 7-1-56
To be completed: Jan. 57

When these pictures were taken, "C's" were tearing off old asphalt from Cascade, Idaho, streets and hauling it away for use as fill on the new highway. Because C Tournapull can make a non-stop U-turn in a space only 30' wide (less than machine's length) it works rapidly in restricted areas such as this city street. Power-steer through geared king-pin allows prime-mover to turn 90° right or left.

State Highway 15 is an important link between the northern and southern parts of Idaho. Besides carrying heavy tourist traffic, many important Idaho products — millions of board feet of lumber, lead, zinc, silver and gold ores, monazite (needed for the atomic energy program), farm products, grain, cattle, and sheep — must be trucked to market over this route. Because traffic has grown too heavy for the old Highway 15, the Idaho State Highway Commission and Bureau of Public Roads is improving the poorest sections of its 120-mile length. Duffy Reed's million-dollar, 1½-million-yard contract to relocate the road through Round Valley is part of this larger project.

"C" spreads a load of sand and earth in controlled lifts to build up grade through Round Valley. "C Tournapull is a good rig for finish work," says Operator Maurice V. Cole.

Rubber-tired scrapers

rip asphalt... dig out soft spots... handle rough work on mountain highway job

Idaho State Highway 15 passes through the center of the city of Cascade. When Duffy Reed Construction Co., of Twin Falls, was awarded the contract to relocate and reconstruct 13.7 miles of this highway, job included tearing out the old asphalt from the city's main street. Company officials decided to use this broken paving to fill soft spots in other parts of the road.

Duffy Reed sent four C Tournapulls to move this scarified asphalt material. The "C's" maneuvered easily in confined quarters of city streets, spotted quickly for push-loading, got away fast with pay loads averaging 10 yards.

In out-of-town highway traffic, Tournapulls often had to make rough roadside detours to pass power shovels digging culvert trenches across road grade. Heavy traffic caused further delays. Most of the time, Tournapulls traveled the highway in fourth or fifth gear, at speeds to 30 mph.

"C's" were assigned to clean out the muck because they work easily in soft footing where other haul units bog down. Their exclusive power-transfer differential automatically delivers more power to the drive wheel on firmer footing... slows the spinning wheel to keep it from "digging in". In very soft material, power-steer through geared king-pin enables operator to pivot drive wheels to firmer footing, "walking" the machine out of bad spots.

Says Owner Duffy E. Reed, "I like the way C Tournapulls get around in mud, and the way they handle excavation."

NEW improved 18-yard heaped capacity Fullpak "C" will give you faster, bigger loads than shown in this job report. New lower, wider bowl packs in load to back corners with live, boiling action, heaps quickly for big, low-void pay-load. Get details now.

"Easy on the operator"

One important Tournapull advantage is the comfort it offers the operator. He sits relaxed in an air-foam, cushioned seat. He steers, raises, or lowers the scraper bowl, brings the tailgate forward, or raises the apron for dumping, with simple, electric, push-button controls. Big, low-pressure tires absorb shocks in rough going. Says Operator Maurice V. Cole, "Tournapulls are easy on the operator. You're not worn out when the day is over."

"It is easy to learn how to operate the Tournapull," adds Owner Duffy Reed.

Likes Tournapull interchangeability

"Tournapulls are adaptable, too, so I can switch anytime from scraper to rear-dump trailing unit," continues Reed.

Actually Tournapull prime-mover can be interchanged on rear-dump, bottom-dump, side-dump, logging arch, flat-bed, and crane. Each of these trailing units costs only about one-fourth as much as the original Tournapull.

Get the facts, now

It will pay you to investigate Tournapull's many advantages. Your LeTourneau-Westinghouse Distributor will be glad to show you additional facts and figures, including owner-verified job reports on work similar to yours.

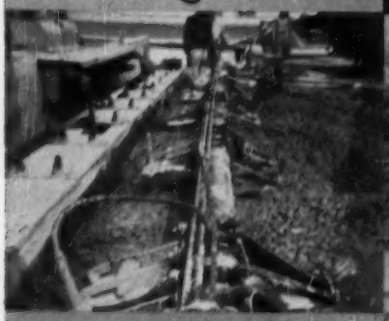
Tournapull—Trademark Reg. U.S. Pat. Off. P-894-H-b

LeTourneau-WESTINGHOUSE Company

Peoria, Illinois

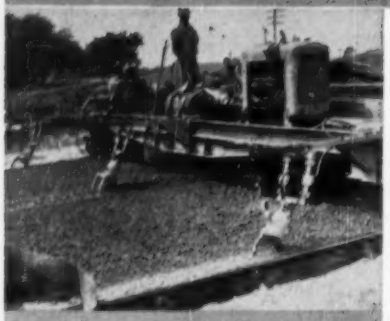
A Subsidiary of Westinghouse Air Brake Company

Everything FOR MORE PROFITABLE PAVING



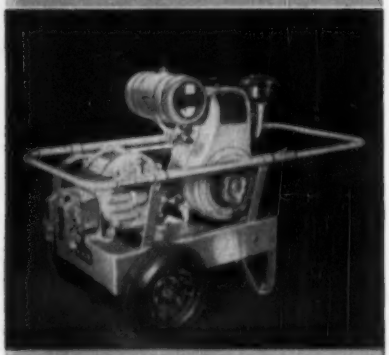
JACKSON PAVING TUBE (INTERNAL TYPE)

JACKSON MULTIPLE VIBRATORY COMPACTOR



JACKSON SIDE FORM VIBRATOR

JACKSON VIBRATORY SCREED



JACKSON POWER PLANT

MACADAM BASE COURSES, SUB-BASES, SOIL-CEMENT PAVING, FILLS

The JACKSON MULTIPLE COMPACTOR has now thoroughly demonstrated that it is by far the most advantageous equipment for achieving or exceeding specified densities in rock, slag, sand, gravel . . . all granular soils used in waterbound and penetration macadam construction, and in filling the voids in rock and slag courses with fines. The Jackson does it in about half the time required with other types of equipment. It is equally efficient for consolidating large granular soil fills such as bridge approaches and kindred projects.

JACKSON INTERNAL TYPE PAVING TUBE

Supplied with extraordinarily powerful motors, no concrete highway or airport paving job is too tough for this improved machine. Tubes vibrate deep in concrete, quickly plasticizing harsh dry mixes in slabs to 24" thick and as wide as 25'. It saves time, saves cement; provides greater density and compressive strength. Cuts spreading costs where no spreader is used. The tube is made up of one unit as shown for each 5'-0" (maximum) of slab width. Usually attached to front of finisher and controlled by finisher operator. Power is supplied by a Jackson Power Plant mounted on the parent equipment.

Use of a JACKSON Side Form Vibrator on standard finisher assures thorough consolidation and plasticity of concrete at side and center forms—with no "missed" spots. Labor savings effected quickly repay cost of equipment.

MUNICIPAL PAVING—BRIDGE DECKS, ETC.

For jobs of this type a JACKSON Vibratory Screed and Portable Power Plant is the most convenient, productive and inexpensive outfit you'll find anywhere. Strikes off to any crown, undercuts at curb and sideform, works right up to and around all obstructions. Two men easily handle it on all slabs up to 30 feet wide, and it may be rolled back for second passes on 4 rollers.

PORTABLE POWER:

Thoroughly reliable, time-proved plants in capacities of 1.5 to 7.5 KVA . . . equipped with permanent magnet generators requiring no maintenance or adjustment. They provide both single and 3-phase 120 V., 60 Cy. AC and may be used for lights as well as operating all JACKSON equipment.

FOR SALE OR RENT AT YOUR JACKSON DISTRIBUTOR

JACKSON VIBRATORS, INC. LUDINGTON MICHIGAN

Materials and Labor Prices

Monthly Market Quotations by ENR Field Reporters

See following ENR issues for OTHER PRICES: • June 28—Clay Products, Lime, Plaster, Paint, Roofing, Wage Rates, Building Board, Lath, Insulation • July 5—Cement, Aggregates, Ready-mixed Concrete, Asphalt • July 12—Iron & Steel Products, Pipe

LUMBER, TIMBER, PLYWOOD—PER M FT., B.M., CARLOAD LOTS F.O.B.

SOUTHERN PINE AND DOUGLAS FIR

All Southern Pine is No. 2 common or better and for No. 1 N. C. Box. (Prices in Bold Face)

All Fir boards, dimensions, planks No. 2, Fir small timbers and timbers are No. 1. Lengths up to 80 ft. (Prices in italics)

		1x6 s4s	1x8 s4s	2x4 s4s	2x6 s4s	2x8 s4s	2x10 s4s	3x12 Rough	6x12 Rough	12x12 Rough
Atlanta	†	**$83.00**	**$85.00**	**$77.50**	**$76.00**	**$79.50**	**$83.00**	**$81.00**	.....	.....
Baltimore	*	**93.00**	**98.00**	**98.00**	**100.00**	**100.00**	**104.00**	**114.00**	.....	.....
		110.00g	*110.00g*	*128.00g*	*128.00g*	*128.00g*	*128.00g*	*133.00g*	*$144.00*	*$144.00*
Birmingham	†	**88.00**	**88.00**	**81.00**	**88.00**	**91.00**	**96.00**	**111.00**	.....	.....
		111.50	*111.50*	*114.50*	*115.00*	*115.00*	*116.50*	*114.50*	*111.50*	*111.50*
Boston	‡	**113.00a**	**116.00a**	**116.00a**	**118.00a**	**118.00a**	**115.00a**	.....	.....	.....
		100.00a	*98.00a*	*119.00*	*119.00*	*119.00*	*114.00*	*138.00*	*140/145*	*145/155*
Chicago	**	**101.00**	**104.00**	**97.00**	**112.00**	**120.00**	**121.00**	**116.00**	.....	.....
		111.00	*111.00*	*128.00*	*128.00*	*128.00*	*128.00*	*131.00*	*131.00*	*131.00*
Cincinnati	*	**101.25**	**102.80**	**90.00**	**98.25**	**103.00**	**111.50**	**119.50**	.....	.....
		108.00	*108.50*	*111.50*	*113.25*	*114.75*	*115.00*	*138.00*	*138.00*	*138.00*
Cleveland	**	**96.00**	**108.00**	**108.00**	**105.00**	**105.00**	**108.00**	.....	.....	.....
				128.00	*118.00*	*118.00*	*118.00*	*138.00*	*138.00*	*138.00*
Dallas	‡‡	**75.00**	**80.00**	**70.00**	**72.00**	**70.00**	**70.00**	**130.00**	.....	.....
Denver	*	Not in stock		*180.00*	*181.00*	*181.00*	*188.00*	*188.00*	*184.00*	*184.00*
Detroit	‡	**115.00**	**118.00**	**114.00**	**115.00**	**118.00**	**122.00**	.....	.....	.....
		125.00	*125.00*	*133.00*	*130.00*	*130.00*	*135.00*	*138.00*	*136.00*	*136.00*
Kansas City	*	**130.00**	**130.00**	**125.00**	**130.00**	**140.00**	**140.00**	.....	.....	.....
		150.00	*150.00*	*150.00*	*150.00*	*135.00*	*140.00*	*165.00*	*186.00*	*$10.00*
Los Angeles	‡	*107.00*	*107.00*	*107.00*	*107.00*	*107.00*	*107.00*	*128.00*	*128.00*	*128.00*
Minneapolis	#	*135.00*	*135.00*	*145.00*	*145.00*	*145.00*	*145.00*	*188.00*	*188.00*	*185.00*
Montreal	ab	**100.00**	**110.00**	**100.00**	**100.00**	**110.00**	**110.00**	.....	.....	.....
		180.00	*180.00*	*180.00*	*180.00*	*180.00*	*180.00*	*170.00*	*170.00*	*170.00*
New Orleans	†	**106.00**	**106.50**	**96.50**	**91.00**	**96.00**	**100.00**	**124.00**	.....	.....
	†	*121.50*	*121.50*	*136.50*	*151.50*	*151.50*	*151.50*	*144.00*	*144.00*	*144.00*
New York	‡	**120.00**	**122.00**	**127.00**	**131.00**	**131.00**	**131.00**	**175.00**	.....	.....
				139.50	*133.00*	*133.00*	*133.00*	*170/180*	*176/185*	*176/185*
Philadelphia	‡	.....	Range from $117.00 to $137.00					**117/137**	**117/137**	.....
			Range from $131.00 to $162.00					*131/143*	*156/158*	*165.00*
Pittsburgh	†	**103.00**	**107.00**	**94.00**	**105.00**	**110.00**	**110.00**	**165.00**	.....	.....
		120.00	*122.00*	*136.00*	*138.00*	*146.00*	*155.00*	*180.00*	*180.00*	*803.00*
St. Louis	#	**117.00**	**119.00**	**128.00d**	**131.00d**	**131.00e**	**137.00e**	.....	.....	.....
				141.00	*141.00e*	*141.00e*	*148.00e*	*195.00*	*195.00*	*189.00*
San Francisco	A	*86.00*	*88.00*	*91.00*	*91.00*	*91.00*	*91.00*	*110.00*	*128.00*	*149.00*
Seattle	†	*71.00*	*78.00*	*80.00*	*80.00*	*80.00*	*80.00*	*100.00*	*110.00*	*110.00*
Toronto	a	**108.00**	**111.00**	**106.00**	**106.00**	**106.00**	**112.00**	**122.00**	.....	.....
		116.00	*119.00*	*135.00*	*135.00*	*133.00*	*148.00*	*181.00*	*158.00*	*158.00*

	LONG LEAF Y. P. Merchantable grade up to 20 ft.		PLYWOOD Rail freight increment (See note for base price)	
	2x12 Rough	12x12 Rough	¾"	¾"
			$22.32	$27.24
	$170.00	$188.00	25.92	31.60
	118.00	160.00	21.78	26.58
	.....	.....	25.92	31.60
	.....	.....		
	144.00	144.00	22.45	27.37
	141.75	141.75	25.00	30.48
	.....	.....	24.57	30.03
	.....	.....		
	130.00	130.00	18.72	22.80
			13.92	16.98
	.....	.....	25.00	30.48
	.....	.....		
	.....	.....	16.56	20.16
	.....	.....	16.61ab	20.25ab
	.....	.....	19.90	24.25
	123.00	123.00	.....	.....
	158.00	154.00	18.72	22.80
	260/280	260/280	25.92	31.60
	214/224	214/224	25.92	31.60
	146.00	.....	25.92	31.60
	.....	.....		
	.....	.....	18.72	22.80
	.....	.....		
	.....	.....	12.22	14.91a
	.....	.....	.....	.....
	115.00	.....	.....	.....
	.....	.....	.....	.....

† F.o.b. mill. * F.o.b. city, CL, out of yard. ** F.o.b. city, CL, direct mill shipment. ‡ Deliv. to contr. CL. 1. Retail, LCL, at yard. # Retail, LCL, deliv. 2. Deliv. truck lots. 3. and, truckload lots. ‡/3 Mfrbm

LUMBER: Bold Face Type, Southern Pine. Italics, Douglas Fir. *a Spruce. *b Tax exempt. *c 5M lots. *d 8, 10, & 12 ft. lengths. *e 8 to 16 ft. lengths. *g No. 1 common. *j 8ft. lengths. *k No. 3 common. *n #3. A Inel rail rate from North west mills to San Francisco are $11.50 to $15.00 per M ft. bm. From Northern Calif. mills $9.00 by rail, $9.80 by truck. All rates for surfaced stock. For rough, add $3.00 to above figures.

PLYWOOD: Interior Fir Plywood, 4' by 8' panels, 5-ply, sanded 2 sides, water resistant glue, carload lots, delivered per 1,000 sq. ft. surface. Seattle base price on ¼", $154.00; on ⅜", $173.00. Exterior ¼", $171.00, ¾", $192.00. For other centers add rail freight increment from table on proper size. Oiling and edge sealing charges included. *a Lower rate by water shipment. *b 50,000 lb. minimum.

GLASS, EXPLOSIVES, CHEMICALS

	WINDOW GLASS Discounts from jobbers list, Feb. 1, 1950: Single or Double Thickness A quality	B quality	EXPLOSIVES Per lb. 40% Ammonia Gelatin in 50 lb. cases delivered in 200 lb. lots*	
Atlanta	78%	78%	$0.2465	
Baltimore	74%d	78%d	.2465	
Birmingham	83%	83%	.1915	
Boston	72–10%	72–10%	.2465	
Chicago	74%	74%	.2465	
Cincinnati	74%	74%	.2465	
Cleveland	74–3–10%	74–3–10%	.2865	
Dallas	78%	78%	.3540	
Denver	73%	73%	.2515	
Detroit	74–10–10%	74–10–10%	.2465	
Kansas City	76–10%	76–10%	.2515	
Los Angeles	71%	78%	.3490	
Minneapolis	73–10%	73–10%	.2515	
Montreal	40–10–5%bc	40–10–5%b	22.05b	
New Orleans	76%	78%	.2515	
New York	80%	80%	.4125g	
Philadelphia	74%	76%	.2465	
Pittsburgh	78%	78%	.2465	
St. Louis	76–10%	76–10%	.2515	
San Francisco	61%	69%	.2465	
Seattle	68%	71%	.2490	

Price of 60% Ammonia Gelatin is $4.15 per lb. higher than 40% in U. S., $1.75 per 100 lbs. higher in Canada.

Glass: *a Jobbers' list price per box, 14 x 28, as, $42.75 for A quality, $37.50 for B quality; 14 x 20, ds, $60.00 for A quality, $52.75 for B quality. *b Discount from list, Apr. 1951; sales tax included, but 6% tax exemption not allowable for. *c Single thickness. *d Discount 6/15/52. *e Discount off. 12/31/54.

Explosives: * Cartridges of 1¼", 1½", 1¾", 2", 2¼", 2½", 3" diameters. Urban prices influenced by service charges or local storage and delivery regulations do not consistently reflect quantity prices in less congested areas. *g In borough of Kings, Queens, and Richmond and in Manhattan south of Canal St., add delivery charge of $20.00 per trip. *h F.o.b Beloeil (near Montreal), per 100 lb. forcite, 40%. Forcite 60%, $23.80

40% Ammonia Gelatin price ranges in other than urban areas, per lb. (except Seismograph Grades)

	C/L 20,000 lb. net	Tons	200 lb. lots
E. of the Miss., except Fla. and Me	$0.1915	$0.2265	$0.2465
W. of Miss. to Rocky Mtn. States, Fla. and Maine	.1955	.2315	.2515
Rocky Mtn. States	.1965	.2315	.2515
Pacific N. W. States	.1940	.2290	.2490
Pacific S. W. States	.1915	.2265	.2465

PILES, TIES F.O.B.

PILES

Prices per linear foot, fir and pine, bark off, f.o.b. cars, New York. Fir based on Wash. and Ore. points to New York shipping area; pine based on freight from Norfolk.

Dimensions	Points	Length	By Rail Pine*	By Rail Fir
12-in. at butt	6-in.	30 to 50-ft.	$0.51	....
12-in.—2-ft. from butt	6-in.	50 to 59-ft.	.54	....
12-in.—2-ft. from butt	6-in.	60 to 69-ft.	.58	....
12-in.—2-ft. from butt	6-in.	90 to 100-ft.	....	....
13-in.—3-ft. from butt	6-in.	91 to 100-ft.	....	....
14-in.—2-ft. from butt	6-in.	50 to 69-ft.	.59/.68	....
14-in.—2-ft. from butt	6-in.	70 to 79-ft.	.78/.88	.93
14-in.—2-ft. from butt	5-in.	80 to 85-ft.	.83/.93	.94
14-in.—2-ft. from butt	5-in.	85 to 89-ft.	....	1.00
14-in.—3-ft. from butt	5-in.	90 to 100-ft.	....	1.09

* Pine piling over 80-ft. available only in limited quantities

RAILWAY TIES

Prices f.o.b. per tie for carload lots:		6" x 8" x 8' Untr.	6" x 8" x 8' Tr.	7" x 8" x 8'6" Untr.	7" x 8" x 8'6" Tr.
Birmingham*	Hardwood, Grade 3	$1.70	$2.55	Gr. 5 $2.25	$3.33
	Grade 2	1.80	2.35	* 4 2.10	3.18
	Grade 1	1.15	3.00	* 3a 1.70	2.78
Chicago	Red Oak	.....	3.85n	.....	4.60n
New York	S. L. Sap Pine	3.00	4.00	3.00	5.00
	Mixed Oak	2.50	4.50	3.50	5.50
Philadelphia	Red Oak	2.95/3.15	4.50/4.70	3.60/3.80	5.50/5.75
St. Louis	White Oak	2.80	.....	2.80	.....
	Red Oak	2.40	2.95n	2.65	3.30n
	Sap Pine or Cypress	.....	2.85n	.....	3.25n
San Francisco	Douglas Fir	3.13ef	3.09ef	3.88ef	4.65ef

Tr.—Treated; Untr.—Untreated. a Creosoted. b 7" x 9" x 8'. c Empty cel c Green. f f.o.b. cars. * Add 75¢/tie freight charge to Birmingham.

CHEMICALS

Water, sewage treatment, road work, f.o.b. carlots, New York

Bleaching powder in drums f.o.b. works, per 100 lb	$5.02
Chlorine cylinders, liquid, per lb. f.o.b. works	.103
Calcium chloride, 77–80%, flaked, 100-lb. paper bag, f.o.b. works, ton	29.00
Silicate of soda, 52 deg., in drums, f.o.b. works, per 100 lb	2.30
Soda ash, 58%, in paper bags, per 100 lb. dense	1.70
Sulphate of aluminum, commercial, in 100-lb. bags f.o.b. works	1.85
Sulphate of copper, in bags, 99% per 100 lb. f.o.b. works	14.90

Bids Asked—Low Bidders—Contracts Awarded—First Section—

Compiled by Business News Department—Engineering News-Record, 330 W. 42nd St., New York 36, N. Y., ELSIE EAVES, Manager
J. A. MAHONEY, M. WETZEL, L. M. FELIX, F. S. DEMBEK, Reports.
J. H. WEBBER, M. R. ROESSLER, E. R. HUBER, Statistics.

NEW ENGLAND

BUILDINGS—BA

▲† **Mass., Ayer**—BARRACKS—BA 6/26—U. S. Eng., 150 Causeway St., Boston, barracks and battalion headquarters bldgs., Fort Devens, IFB 19-016-56-185. $2,000,000-$2,500,000. Plans deposit $25, refundable. Berla & Abel, 1636 Commonwealth Ave., Wash., D. C. and George M. Ewing Co., 1107 19 St. N.W., Wash., D. C., archts. CD 6/6.

▲ **Conn., Meriden**—BA 7/2—Town, School Bldg. Comn., 22 Liberty St., Meriden, all labor, material, equipment and appliances to furnish and erect all structural steel for East and West Senior High Schools, $5,200,000. Plans deposit $50. Willard Wilkins, 945 Asylum Ave., Hartford, archt. Robert W. Loomis, 32 Maple Ave., Windsor, engr. CD 7/13.

HEAVY CONSTRUCTION—LB & CA

▲ **MASSACHUSETTS**—Commonwealth of Mass., Metropolitan Dist. Comn., Parks Div., 20 Somerset St., Boston,

Mass.—**Berke Moore Co., Inc.,** 8 Newbury St., Boston, Mass. CA $998,869, est. $1,000,000. Proj. 940, reconstr. Revere Beach Parkway, Medford and Everett. Brask Engr. Co., 177 State St., Boston, Mass., engrs.;

Mass.—**S. Rotundi & Sons,** 140 Franklin St., Stoneham, Mass. CA $1,867,497, est. $1,950,000. Proj. 939, reconstr. Middlesex Fells Parkway, Wellington Bridge to Roosevelt Circle, Medford and Malden. Fay, Spofford & Thorndike, Inc., 11 Beacon St., Boston, Mass., engr. CD 6/6 and 6/5, under LB.

BUILDINGS—LB & CA

▲ **Thomas O'Connor & Co., Inc.,** 238 Main St., Cambridge, Mass. CA Over $1,000,000. Total Est. $20,000,000. 125,000 kw electric POWER GENERATING PLANT, Mystic Station, EVERETT, MASS. Boston Edison Co., 39 Boylston St., Boston, Mass. Jackson & Mooreland, Park Square Bldg., Boston, Mass., engrs. CD 6/8/54;

General Electric Co., River Rd., Schenectady, N. Y. CA furnishing turbines and combustion boilers (Everett, Mass.).

▲ **O. D. Purrington, Inc.,** 171 Westminster St., Providence, R. I. LB $1,249,400, est. $1,250,000. high SCHOOL and Pilgrim Memorial School addns., WAREHAM, MASS. Town, Schools & Bldg. Comn., Alfred Beauchemis, chn., Wareham, Mass. Bids June 6. CD 5/18.

MIDDLE ATLANTIC

BUILDINGS—BA

▲ **N. Y., New York**—SCHOOL—BA 6/27—Director Bureau Constr., 42-15 Crescent St., Long Island City, Zone 1, new P.S. 175 West 134 and 135 Sts., between Lenox and Seventh Aves., Manhattan Boro, $2,086,400. Plans deposit $25 for general constr., $10 each for plumbing and drainage, heating and ventilating, electrical work and lighting fixtures. Extended date. CD 5/24.

HEAVY CONSTRUCTION—LB & CA

▲ **NEW YORK**—John W. Johnson, supt. State Dpt. P. Wks., The Gov. Alfred E. Smith State Office Bldg., Albany,

N. Y.—**Louis Mayersohn, Inc.,** 36 State St., Albany, N. Y. CA $751,655. reconstr. relocation 10.2 mi. Rte. 13 starting in Pulaski and exten. southeastward to Albion-Williamstown town line, Oswego Co.;

N. Y.—**John Arborio, Inc.,** West Cedar St., Poughkeepsie, N. Y. CA $649,497. reconstr. 3.13 mi. Rtes. 97 and 42 northwesterly from Port Jervis, Orange Co.; CA $1,641,268. paving 5.77 mi. Palisades Interstate Parkway between Rte. 59 and Rte. 45, Rockland Co.; CA $527,051. paving 2.8 mi. Palisades Interstate Parkway from New York-New Jersey State Line to Rte. 303 Rockland Co.;

N. Y.—**Vernon Christiana Jr.,** 605 Pleasant St., Utica, N. Y. CA $986,047. reconstr. 8.69 mi. sect. of Rte. 3 from Mohawk through Cadyville, Clinton Co.;

N. Y.—**City Constr. Co.,** 820 Broad St., Utica, N. Y. CA $963,042. reconstr. relocation 7.88 mi. Rte. 21 starting near Chenango-Madison Co. line and exten. northeasterly in three sections toward Waterville, Chenango Co.;

N. Y.—**Hogeboom & Campfield, Inc.,** Seneca Turnpike, New Hartford, N. Y. CA $1,167,042. reconstr. 4.5 mi. sect. of Rte. 12 B between Sherburne and Earlville, Chenango Co.;

N. Y.—**H. L. Baughman, Inc.,** 1240 Jefferson Rd., Rochester 23, N. Y. CA $898,646. reconstr. 6.55 mi. Rte. 38 from Tompkins Co. line northerly to Moravia, Cayuga Co.;

N. Y.—**Serafini Constr. Co., Inc.,** Box 265, R. D. No. 1, Conklin Rd., Binghamton, N. Y. CA $1,123,886. reconstr. 7.24 mi. Rte. 34 from Auburn City line to Weedsport, Cayuga Co.; CA $632,467. reconstr. 1.54 mi. Main St. in village of Waterloo portion of Rtes. 5 and 20, Seneca Co.;

N. Y.—**Madison County Constr. Co., Inc.,** Box 14, Madison, N. Y. CA $1,461,230. reconstr. 5.72 mi. Fonda to Fort Johnson sect. of Rte. 5, Montgomery Co.;

N. Y.—**Cold Spring Constr. Co.,** 3 Jackson St., Akron, N. Y. CA $723,203. reconstr. 3.53 mi. sect. of Rte. 19 passing through the village of Fillmore, Allegany Co.;

N. Y.—**Collins Bros., Inc.,** 12 Tallmadge Place, Mechanicville, N. Y. CA $661,608. reconstr., relocation of 3.49 mi. Rte. 30 starting in Wells and exten. northeastward to Rte. 8, intersection, Hamilton Co. Grand total $12,186,642. CD 5/16, under LB.

▲ **Westinghouse Electric Corp.,** 40 Wall St., New York 5, N. Y. LB $1,363,840. (3 bidders) one 30,000 kw frequency changer and associated equip. for 59 St. Power Plant, Contr. P-161, NEW YORK, N. Y. New York City Transit Auth., 370 Jay St., Brooklyn 1, N. Y. Bids May 25. CD 4/20.

▲ **Westinghouse Electric Corp.,** 40 Wall St., New York 5, N. Y. LB $2,537,685 (3 bidders) two 30,000 kw frequency changes and associated equip. for Third Ave. substation, Contr. P-171, BROOKLYN, N. Y. New York City Transit Auth., 370 Jay St., Brooklyn 1, N. Y. Bids May 25. CD 4/20.

▲ **DELAWARE**—State Hy. Dept., Admin. Bldg., Dover.

Del.—**James Julian, Inc.,** 405 du Pont Rd., Elsmere, Del., LB $796,953, Court St. Parkway in Dover,

Del.—**Parini Constr. Co.,** Condor Road, Wrightstown, N. J., LB $340,000. reconstr. Commerce St. in Smyrna, Kent Co. Bids June 6. CD 5/29.

BUILDINGS—LB & CA

▲ **Levitt & Sons, Inc.,** Levittown, Pa. Separate Contracts. $1,258,600. RESIDENTIAL DEVELOPMENT, 203 homes Indian Creek Sect. Jobs 4809 thru 5012, LEVITTOWN, PA.

▲ **Rupert Constr. Co.,** 3400 Lancaster Ave., Wilmington, Del., CA $1,924,907, JUNIOR HIGH SCHOOL, Shipley Rd., WILMINGTON, DEL. Alfred I. duPont Special School Dist., 3606 Concord Pike, Wilmington, Del. Bids May 23. CD 5/10.

SOUTH

BUILDINGS—BA

▲† **Va., Fort Lee**—BARRACKS—BA 6/26—U. S. Eng., foot of Front St., Norfolk Zonel, eight 3 story concrete block enlisted men's barracks (326 men each) ENG-44-110-56-35. $4,500,000. Lublin, McGaughey & Assocs., 220 W. Freemason St., Norfolk, archts., engrs. CD 6/1.

HEAVY CONSTRUCTION—LB & CA

▲ **Holt & Thomason Constr. Co.,** Bell Bldg., Montgomery, Ala. CA, $1,175,000. paving, utilities, and utilities structures, Marine Corps Supply Depot, NOy 91115, ALBANY, GA. P. Wks. Officer, Dpt. Navy, Naval Base, Charleston, S. C. CD 6/7, under LB.

BUILDINGS—LB & CA

▲ **Stone & Webster Engr. Corp.,** 1403 Roseneath Rd., Richmond, Va. CA $22,000,000. design and construct, 150,000 kw GENERATING UNIT and STRUCTURAL UNIT to house generating facilities, PORTSMOUTH, VA. Virginia Electric & Power Co., 7 and Franklin Sts., Richmond, Va. CD 5/23.

▲ **Stone & Webster Engr. Corp.,** 1403 Roseneath Rd., Richmond, Va. CA $21,000,000. design and construct 150,000 kw GENERATING UNIT and STRUCTURAL UNIT to house generating facilities, YORKTOWN, VA. Virgina Electric & Power Co., 7 and Franklin Sts., Richmond, Va. CD 5/23.

▲ **Robert L. Turchin, Inc.,** 1835 Purdy Ave., Miami Beach, Fla., LB $1,500,000. The Florida Shores HOTEL, 9441 Collins Ave. SURFSIDE, FLA. Florida Hotel, c/o M. Tony Sherman, archt., 625 N. E. 78 St., Miami, Fla. Bids May 8. CD 4/27.

▲ **E. E. Farrow Co.,** 109 W. Levey St., Dallas, Tex. LB $1,462,980. (3 bidders) municipal POWER PLANT and equip., ALEXANDRIA, LA. City, Alexandria, La. Bids June 4. CD 5/23.

▲ **R. P. Farnsworth & Co., Inc.,** Box 850, New Orleans, La. CA $2,732,163. Construct and finance 109 one-story bldgs. incl. 200 HOUSING units, outside utilities, Lake Charles Air Force Base, Eng. 41-243-56-45, LAKE CHARLES, LA. U. S. Eng., Box 1229, Galveston, Tex. CD 4/2, under LB.

▲ **Fluor Corp., Ltd.,** 2500 Atlantic St., Los Angeles, Calif. CA $6,250,000. design and construct 10,000 b/d COKER AND CALCINING UNIT, LAKE CHARLES, LA. Lake Charles Chemical Corp., c/o Continental Oil Co., Lake Charles, La. CD 3/22.

▲ **Southern Builders, Inc.,** Box 1815, Shreveport, La. LB $1,643,000. (5 bidders) CITY HALL, SHREVEPORT, LA. City Council, City Hall, Shreveport, La. Bids May 31. CD 5/17.

MIDDLE WEST

HEAVY CONSTRUCTION—LB & CA

▲ **Witter-Gaddis Corp.,** Schererville, Ind., LB $4,501,306, Chase St. interceptor sewer, and local sewer; booster plant and lift station, GARY, IND. Bd. Sanitary Comrs., City, City Hall, Gary, Ind. Bids June 1. CD 5/22.

BUILDINGS—LB & CA

▲ **Altman-Coady Co.,** 1251 Fairwood Ave., Columbus, O. CA $1,465,939, 2 level, 75,000 sq. ft. concrete steel ENGINEERING BLDG. addn., COLUMBUS, O.; North American Aviation, Inc., 4300 E. 5 Ave., Columbus, O.

▲ **Henry C. Beck Co.,** 1st Natl. Bank Bldg., Atlanta, Ga., CA Est. $1,600,000. 1 story, 125,000 ft. brick, concrete PLANT, OLMSTED FALLS, O. Dairypak, Inc., 5020 Brookpark Rd., Cleveland 29, O. Awarded June 5. CD 12/13.

▲ **Lukek Development Co. and H. & R. Development Co.,** 600 E. 305 St., Willowick, O. Own Forces. $8,000,000. 415 HOMES, in Willo-Rush Estates, WILLOWICK, O. Awarded June 1.

WEST OF MISSISSIPPI

HEAVY CONSTRUCTION—BA

▲† **Mo., Grandview**—HOSPITAL—BA 6/28—U. S. Eng., 1800 Federal Office Bldg., 911 Walnut St., Kansas City 6, Mo., 2 story, hospital, Grand View Air Force Base, Spec. 56-96, $1,000,000. CD 6/7.

▲ **Ark., Little Rock**—BA 7/2—City, Municipal Bd WW Comrs., City Hall, dam and spillway for 64 billion gal. Big Maumelle Reservoir, near here. est. $3,062,750 as of January 1954. Total project est. $10,650,000. Kenneth Lefever and Max A. Mehlburger, Pyramid Bldg., Little Rock, Malcolm Pirnie Engineers, 25 W. 43 St., New York, N. Y., engrs. CD 1/12.

BUILDINGS—BA

▲ **Mo., North Kansas City**—HOSPITAL—BA 7/12—North Kansas City Memorial Hospital, Merrill Burnidge, chn., Bd. Trustees, c/o city clk., City Hall, North Kansas City, 2 story, brick, concrete hospital, Birmingham Rd. and Hy. 10 in Clay Co., $1,210,000. Plans deposit $50. Hewitt & Royer, 707 Westport Rd., Kansas City 11, Mo., archts. CD 4/17.

▲† **N. M., Los Alamos**—HOUSING—BA 7/17—Atomic Energy Comn., Los Alamos Area Office, Los Alamos, Group 18 housing phase "B" 100 dwelling units, $1,200,000-$1,500,000. Extended date. CD 6/4.

▲ **Tex., Killeen**—HOUSING—BA 7/17—U. S. Eng., 100 W. Vickery Blvd., Fort Worth, construct and finance, 125 family quarters, 62 duplex bldgs. and one detached, Gray Air Force Base, est. $1,000,000.

(Continued on page 96)

PROJECTS COVERED

By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterways $44,000; other public works $75,000; industrial buildings $93,000; other buildings $344,000. Also Foreign projects of $100,000 and more in size of interest to American contractors.

By Regions & Classes of Construction
(In order of Listing)

BIDS ASKED
LOW BIDDERS
CONTRACTS AWARDED

New England	**Middle West**
Middle Atlantic	**West of Mississippi**
South	**Far West**

PROPOSED WORK

Water Supply	**Public Buildings**
Sewers, Waste Disposal	**Mass Housing**
Bridges	**Commercial Buildings**
Streets & Roads	**Industrial Buildings**
Earthwork, Waterways	**Unclassified**

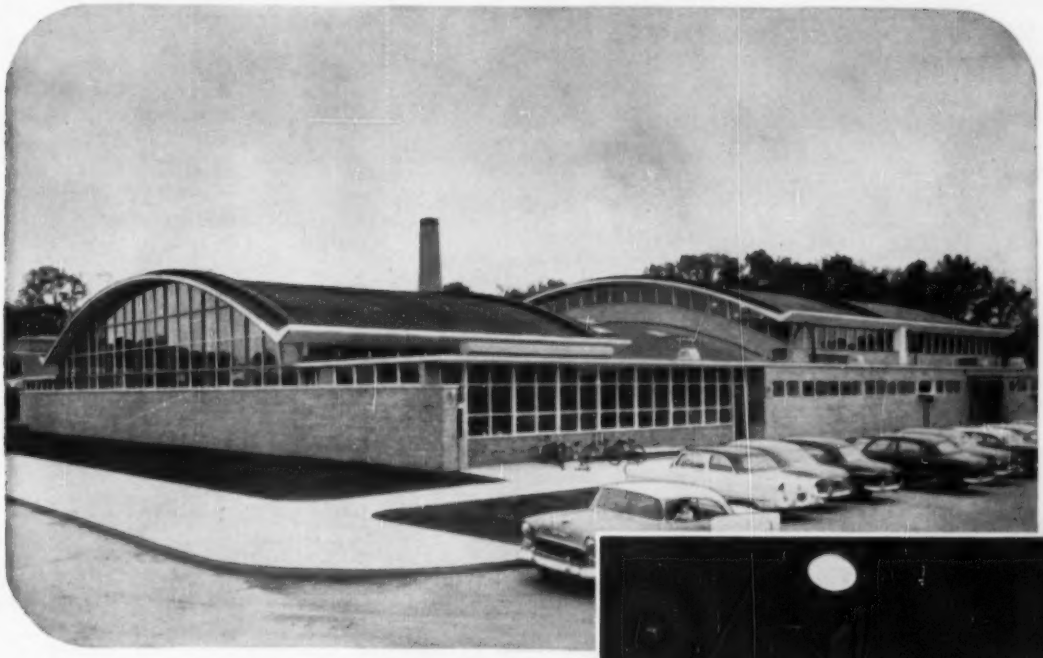
In These Stages

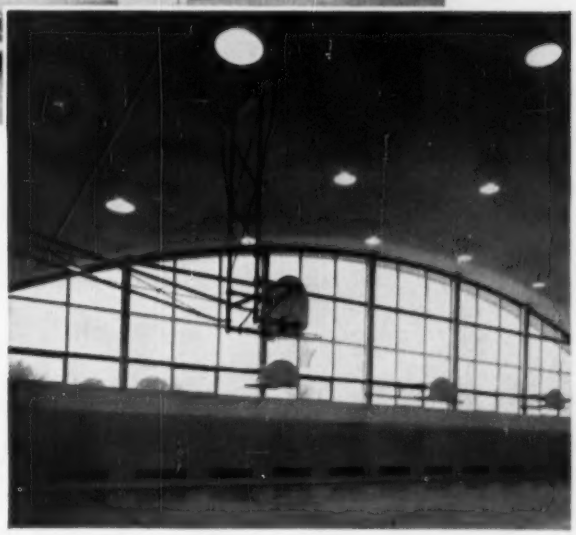
PROPOSED WORK: Before and including appointment of engineers or architects.
BIDS ASKED: BA (new announcements only). For full calendar, see also preceding issues.
SOON LETS CONTRACT: SLC
LOW BIDDERS: LB On jobs below $500,000 in value all low bidder news will be the final reports published on the projects involved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.
CONTRACTS AWARDED: CA Except awards to low bidders previously reported in low bidder stage.
CD dates shown are of Construction Daily issue in which last previous report was published.
OWNERS, ENGINEERS, ARCHITECTS, CONTRACTORS are invited to report their new jobs for listing in these reports when they meet or exceed the size minimums shown above. Address these news releases to J. A. Mahoney, REPORTS, ENGINEERING NEWS-RECORD, 330 W. 42 St., New York 36, N. Y.

Symbols and Abbreviations Include:

†	**Federal Government**
▲	**Project of $1,000,000 or over.**
ENR	**Engineering News-Record**
CD	**Construction Daily**

For additional reports see Construction Daily.





Design of Edsel Ford High School features distinctive, economical

Concrete Shell Roofs

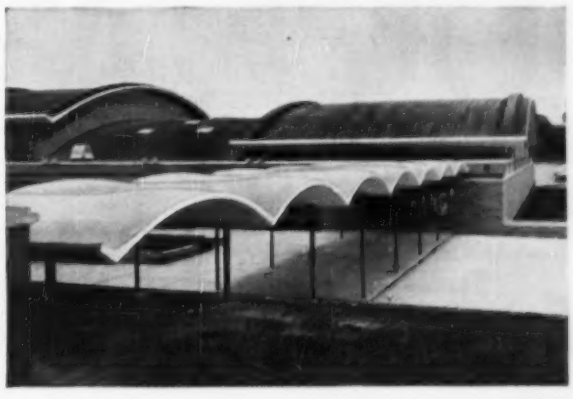
The first concrete shell roofs constructed in Michigan were used in the Edsel Ford High School in Dearborn. Four shell units were built: two over the boys' gym, one over the girls' gym, and a fourth over an intermediate building housing the swimming pool and locker rooms. All four roofs have spans of 100 ft. and identical arches of 121-ft. radius and a rise of 13 ft.

Concrete shell roof construction was selected because (1) it provided unobstructed interiors, (2) it was adaptable to the architectural design and (3) it was economical to build.

Concrete shell roof construction is gaining rapidly in popularity with architects and engineers for buildings requiring large unobstructed floor areas. Roofs with spans up to 300 ft. and more can be built without interior columns. They are ideal for auditoriums, exhibit halls, hangars, train sheds, repair shops and warehouses.

Concrete shell roofs are economical to build, need little or no maintenance, have long life and low insurance rates. They are true *low-annual-cost* construction. Write for free illustrated literature. Distributed only in the United States and Canada.

Large photo shows completed structure. Girls' gym is in foreground, boys' gym in rear. Depressed roof between gyms covers swimming pool and locker rooms. Small photo above shows clean, unobstructed interior in boys' gym. Photo below shows how shell roof design was repeated in roof over walk connecting gymnasium wing with auditorium. Architect, Eberle M. Smith Associates, Inc.; engineer, Alfred Zweig; contractor, O. W. Burke Construction Co. All are from Detroit.



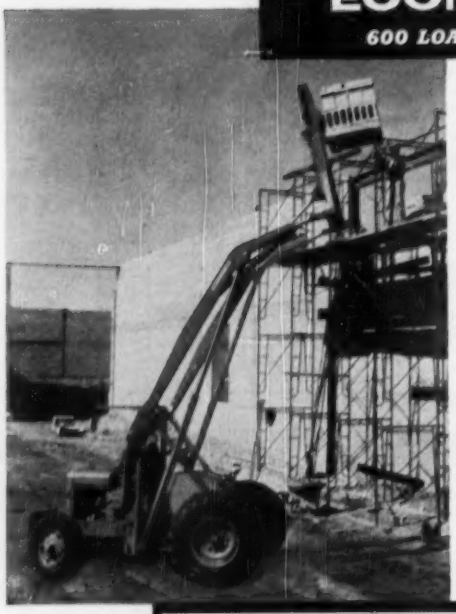
PORTLAND CEMENT ASSOCIATION

Dept. 6C-17, 33 West Grand Avenue, Chicago 10, Ill.

A national organization to improve and extend the uses of portland cement and concrete . . . through scientific research and engineering field work

automatic self-leveling?

the ECONMOBILE 600 LOADER has it!



The ECONMOBILE's integral automatic self-leveling feature is only one of many that already have made this high-lift, hydraulic loader a favorite of the construction world.

Consider these factors: The ECONMOBILE's lift of 18 feet —or 22 feet with auxiliary tower; its reach of up to 6 feet from wheel to heel; its mobility and speed; its 90% use factor with a wide range of attachments.

It's not surprising that one contractor reported his ECONMOBILE served 68 masons with only 8 general laborers.

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IF IT'S A

WET JOB

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GRIFFIN

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Kinnear *originated* the upward-acting door with the curtain of interlocking steel slats. For more than half a century, Kinnear has built doors *exclusively*—your assurance of highest quality. Write for Kinnear catalog!

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1742 Yosemite Ave., San Francisco 24, Calif.

KINNEAR ROLLING DOORS
Saving Ways in Doorways

(Continued from page 94)

HEAVY CONSTRUCTION—LB & CA

▲ **B & M Constr. Corp.**, Republic Bldg., Oklahoma City 2, Okla., CA **$3,851,891**, est. $3,889,000, 40 mi. 8- to 48-in. c.i. water mains, OKLAHOMA CITY, OKLA., City, City Hall, Oklahoma City, Okla. Bids May 29, awarded June 5. CD 6/4, under LB.

▲ **American Bridge Div., U. S. Steel Corp.**, M & M Bldg., Houston 2, Tex., LB **$2,197,358**. bridge superstructure (lift) over Tule Lake Ship Channel near Savage Lane, CORPUS CHRISTI, TEX. City, City Hall, Corpus Christi, Tex. Harrington & Cortelyou, 1004 Baltimore Ave., Kansas City 5, Mo., engrs. Bid May 31.

BUILDINGS—LB & CA

▲ **Nicholson-Bilhorn**, 7811 Carondelet Ave., Clayton 24, Mo. Owner Builds. **$1,050,000**. 150 addnl. RESIDENCES in Sect. 6 of Ballwin Hills subdivision south side of Manchester Rd., incl. sanitary sewers and streets, BALLWIN, MO.

▲ **Mayer-Raischer-Mayer Constr. Co.**, 119 N. 7 St., St. Louis 1, Mo. Owner Builds. **$2,000,000**. 200 addnl. RESIDENCES in Sect. 2 Paddock Hills community off new Florissant Rd. between St. Catherine St. and Rte. 140, FLORISSANT, MO. Robert Elkington, 7916 Kingsbury Ave., St. Louis 24, Mo., archt.

▲ **Harmon Constr. Co.**, 28 S. Indiana St., Oklahoma City 3, Okla., CA **$1,504,997**. est. $1,000,000. 16 story OFFICE and garage, Second St., OKLAHOMA CITY, OKLA. Liberty National Bank & Trust Co., Liberty Bank Bldg., Oklahoma City, Okla. Bids May 21, awarded June 5. CD 6/5, under LB.

▲ **Edwin Flato Co.**, 2022 Laredo St., Corpus Christi, Tex. Force Account, **$368,425**, 30 DWELLINGS; **$382,165**, 35 DWELLINGS; **$376,195**, 23 DWELLINGS, CORPUS CHRISTI, TEX. Grand total $1,126,785. CD 5/3.

▲ **Centex Const. Co.**, Marshall St., Houston, Tex. Owner Builds. **$378,610**, 32 DWELLINGS; **$366,165**, 28 DWELLINGS; **$375,410**, 35 DWELLINGS, FARMERS BRANCH, TEX. Grand total $1,120,185. CD 5/9.

▲ **Texas Gulf Constr. Co.**, Box 661, Houston 1, Tex. LB **$1,909,185**. 4-level masonry Federal Reserve Bank Branch OFFICE, HOUSTON, TEX. Federal Reserve Bank of Dallas, 400 S. Akard St., Dallas, Tex. Bids May 31. CD 5/9.

▲ **Delta Engineering Corp.**, 2121 San Felipe Rd., Houston, Tex., CA **$2,750,000**, 25,000,000 cu. ft. gas daily capacity, GASOLINE REFINERY, CA **$100,000** some crude oil gathering lines, MIDLAND, TEX. Cities Service Oil Co. and Associated Companies, M. Esperson Bldg., Houston, Tex. CD 3/26.

▲ **J. C. May & Assocs.**, 1971½ Heights Blvd., Houston, Tex. Own Forces. **$390,000**, 40 DWELLINGS; **$347,500**, 28 DWELLINGS; **$372,190**, 34 DWELLINGS, ROCKPORT-FULTON, TEX. Grand total $1,109,690. CD 5/16.

▲ **Spiegelberg Lumber & Bldg. Co.**, 259 W Fremont St., Laramie, Wyo., CA, **$1,830,600** LIBRARY, SERVICE and GEOLOGY BLDG., LARAMIE, WYO. State of Wyo., University of Wyo., Campus, Laramie, Wyo. Bids May 4. CD 5/15, under LB.

▲ **White, Green & Addison Associates, Inc.**, Boston Bldg., Denver, Colo., contract cancelled, University of Colorado EXTENTION CENTER, DENVER, COLO. Est. **$2,000,000**. Colorado University, lessee. CD 5/23, under CA.

FAR WEST

BUILDINGS—BA

▲ **Calif., Sacramento**—RESEARCH HEADQUARTERS—BA 7/10—State Div. Architecture, 1120 N St., 1 story, 60,400 sq. ft. part bsmnt., rein.-con. research headquarters bldg. for State Div. Hys. $1,000,000. Plans deposit $75.

HEAVY CONSTRUCTION—LB & CA

▲ **Ross B. Hammond**, 1241 N. Williams St., Portland, Ore. LB **$3,562,815**. (5 bidders) terminal, Portland International Airport, PORTLANT, ORE. Port of Portland, Swan Island, Portland, Ore. Bids June 8. CD 3/27.

▲ **CALIFORNIA**—State Div. Hyt., 1120 N St., Sacramento,

A. **Teichert & Son, Inc.**, 1931 Stockton Blvd., Sacramento, Calif. LB **$2,784,349**. (4 bidders) 7 mi. freeway on U. S. 99 in vicinity of Galt, structure to provide 4 overcrossings, an underpass, separation and 6 bridges, Sacramento and San Joaquin Counties. Bids June 6. 5/11.

BUILDINGS—LB & CA

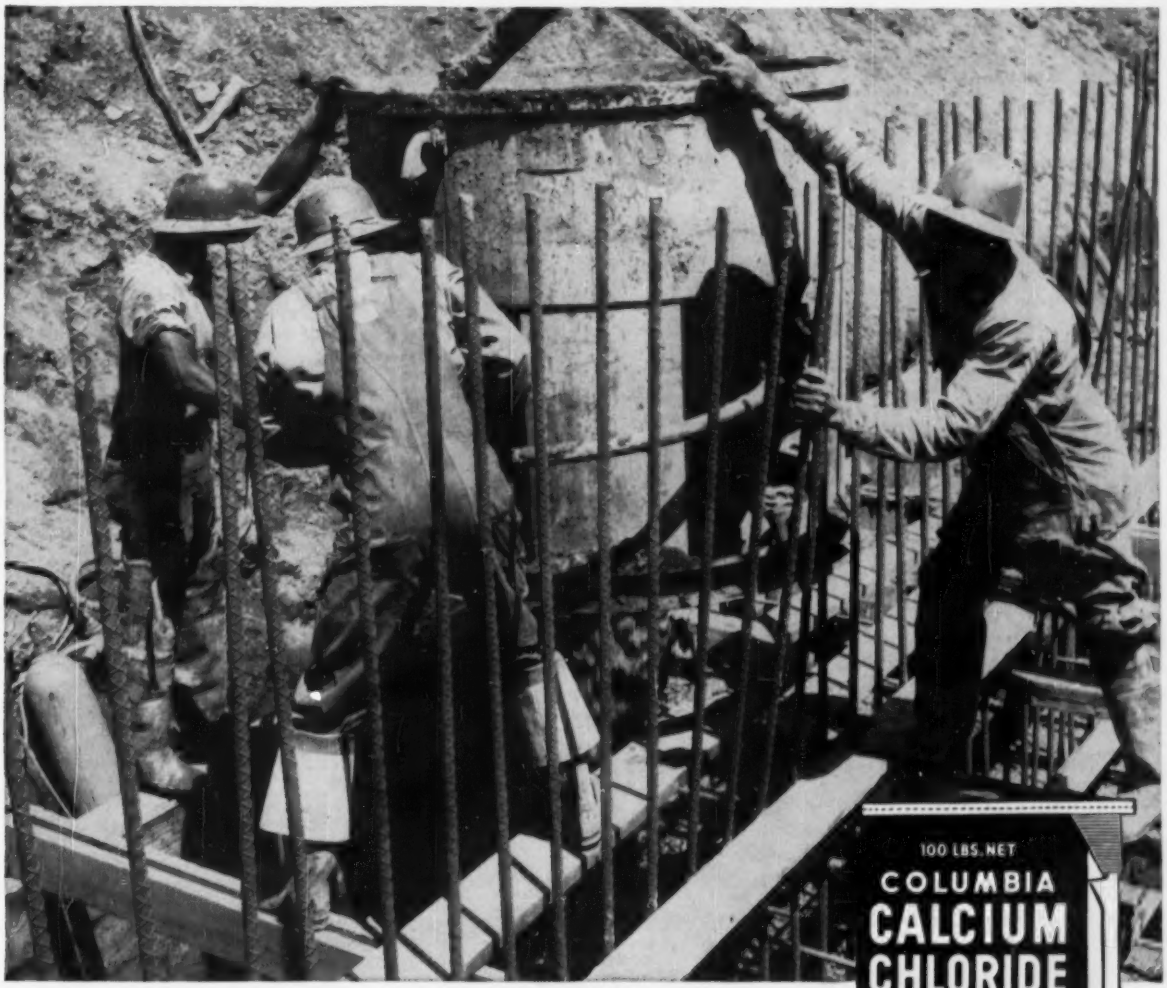
▲ **Henrik Valley Company**, 413 Third Ave., West, Seattle, Wash. LB **$1,698,000**, est. $1,350,000. (6 bidders) Jefferson Park Junior High SCHOOL, SEATTLE, WASH. School District No. 1, 815 4 Ave. N., Seattle, Wash. Bids June 6. CD 5/23.

▲ **Woodcrest Constr. Co.**, 1763 E. 41 St., Los Angeles, Calif. CA **$1,215,152**, 86 frame, stucco DWELLINGS, Tract 2664, LA HABRA, CALIF. Brea Homes, Inc., 1763 E. 41 St., Los Angeles, Calif.

▲ **Haas & Haynie Frandsen Co.**, 8913 Olympic Blvd., Beverly Hills, Calif. LB **$3,411,000**. (5 bidders) central HEATING PLANT and distr. sys. in Los Angeles Civic Center, LOS ANGELES, CALIF. Los Angeles Co. Hall of Records, Los Angeles, Calif. Bids June 6. CD 5/18.

▲ **Homes of Merit**, 9054 E. Garvey Ave., San Gabriel, Calif. Owner Builds. **$1,106,040**. 99 frame, stucco DWELLINGS, Arrow, Nubia, Albertson Sts. in Tract 21240. WEST COVINA, CALIF.

(Continued on page 98)



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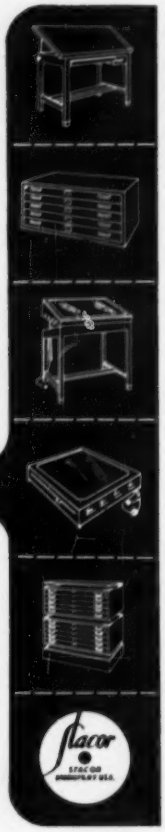

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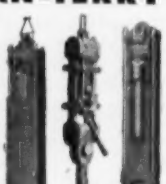

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(Continued from page 96)

PROPOSED PROJECTS

WATER SUPPLY

Mont., Bozeman—City, voted $1,500,000 bonds, city water supply expansion. CD 4/26.

▲ **O., Batavia**—Comrs. Miami Twp., Clermont Co., Batavia, complete public water supply, $1,500,000. Jack H. Fuller, 202 Wooster Pike, Milford, consult. civil engr. (Correction-engineers address). CD 5/31.

▲ **O., Huron**—Village, A. H. Klein, supt. City Utilities, City Hall, WW sys. incl. intake line extending half mile into Lake Erie, pressure tank with 250,000 gal. capacity, new piping from tank to mains, new treatment, pumping and filter plant with capacity of 2 m.g.d. $1,205,000. CD 11/11.

▲ **Tex., Brownsville**—City, water storage, $250,000, water distrb. lines, $1,200,000, WW sys. rehabilitation, $100,000. Black & Veatch, Woods Chapel Rd., Kansas City, Mo., consult. engrs. CD 6/1.

▲ **Tex., Irving**—City, City Hall, c.i. water lines, $1,716,000; water storage, $150,000. Homer A. Hunter & Assocs., 3708 Abrams Rd., and Koch & Fowler, 3900 Lemmons St., Dallas, consult. engrs. CD 5/2.

SEWERS, WASTE DISPOSAL

Conn., Hartford—Metropolitan District, 115 Broad St., sanitary sewer, Burnside Ave., Cummings, Preston, Arbutus, Greenlawn, Concord and Highview Sts., East Hartford. $143,931. Warren Gentner, c/o owner, engr.

▲ **O., Cleveland**—Comrs. Cuyahoga Co., Court House, Zone 13, trunk sewer program in Belvoir Rd. area incl. flood control dam in Nine Mile Creek, South Euclid, $4,837,000. Pease Eng. Co., 3482 Lee Rd., Zone 20, consult. engr.

▲ **Utah, Salt Lake City**—Salt Lake City Corp., R. W. McLeese, city engr., City-Co. bldg., sewerage treatment plant near new sewage pumping plant. $3,500,000. Clyde C. Kennedy Co., 604 Mission, San Francisco, Calif., consult. engr. CD 3/21/55.

▲ **Wash., Parkland**—Parkland Sewer Comn., Parkland, defeated $2,000,000 bonds, 8 mi. 18 in. trunk sewers, collection sys. and disposal plant. CD 4/18.

▲ **Ont., Toronto**—Municipality of Metropolitan Toronto, 67 Adelaide St. E., and Toronto Twp., Municipal Offices, Cooksville, sewerage disposal plant, on Long Branch Rifle Range, $2,460,000. Work expected to start this year.

▲ **Que., Cap Rouge**—Cap Rouge & six other St., Charles River Valley Municipalities, c/o Town Hall, 10 mi. trunk sewer, $1,000,000. Marc Gilbert, 31 Rue McMahon, Quebec City, consult. engr.

EARTHWORK, WATERWAYS

▲ **Nebraska**, York County Rural PP Dist., York expansion of irrigation system. $1,500,000. Raymond H. Reed & Co., Columbus, Neb., consult. engrs.

AIRPORTS

▲ **Calif., Los Angeles**—AIRPORT IMPRVS.—City, City Hall, voted $59,700,000 bonds June 5, Los Angeles International Airport imprvs. CD 2/29.

▲ **Ind., Indianapolis**—AIRPORT—Bd. Aviation Comrs., Indianapolis, jet airport landing strip, $2,000,000; cargo bldg., $300,000, Wier Cook Municipal Airport, South High School Rd. Clyde E. Williams & Assoc., 720 E. 38 St., consult. engrs. CD 11/11/53.

▲ **Wash., Moses Lake**—PAINTING HANGAR—Boeing Airplane Co., 7755 E. Marginal Way, Seattle, Zone 4, plans by Naramore, Bain, Brady & Johanson, 904 7th Ave., Seattle, 187x450 ft. painting hangar, $4,722,000. Bids likely this year. CD 5/14.

LATIN AMERICA

▲ **Mexico, Chihuahua**—AIRPORT—Mexican Govt. (Sria. de Comuniccaciones y Obras Publicas), Mexico City, plans civil airport and 3 mi road, $1,200,000.

PUBLIC BUILDINGS

▲ **Calif., Bakersfield**—SCHOOLS—Bakersfield, City School Dist., 1600 "K" St. voted $4,620,000 bonds, schools.

▲ **Calif., Los Angeles**—WOMEN DETENTION FACILITY—Los Angeles Co., plans by A. C. Martin & Assoc., 333 S. Beaudry, women detention facility, Biscailuz Center, $2,963,934.

▲ **Calif., Manhattan Beach**—SCHOOLS—Manhattan Beach School Dist., Manhattan Beach, voted $2,734,000 bonds, schools.

▲ **Calif., Oakland**—SCHOOLS—Bd. Educ., Administration Bldg., 1025 2 Ave., voted bonds, schools, $40,000,000. CD 3/6.

▲ **Calif., Santa Ana**—PSYCHIATRIC—Orange Co., Court House, Santa Ana, plans by W. L. Faulkner, Spurgeon Bldg., Santa Ana, psychiatric bldg., Orange County General Hospital. $1,256,125.

(Continued on page 100)

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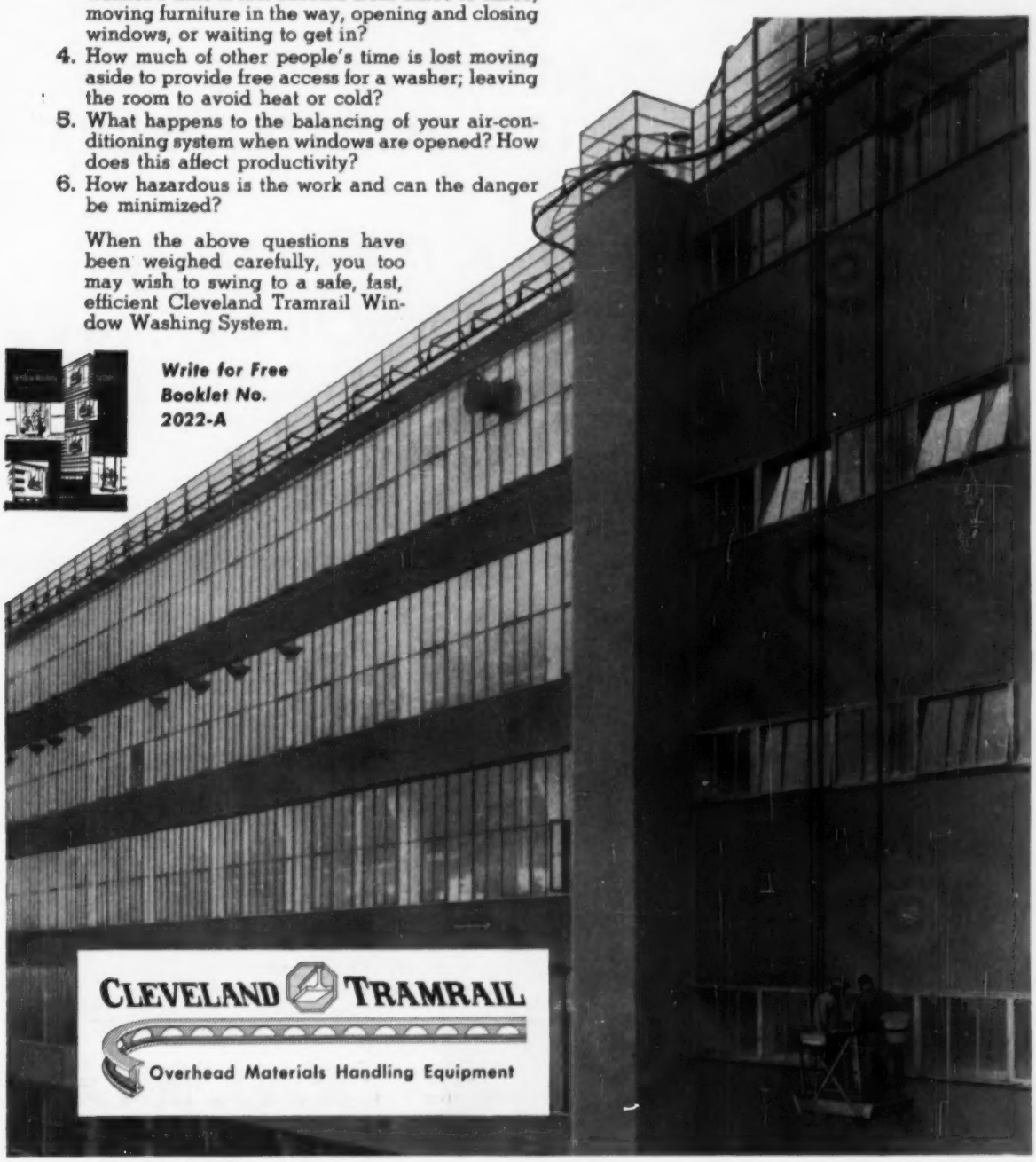

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(Continued from page 98)

▲ **Conn., Greenwich**—SCHOOLS—Town, West Junior high school, $2,000,000, elementary school north section of town, $500,000, elementary school north section of town, $500,000. CD 8/12/54

▲ **Conn., New Britain**—HOUSING—New Britain Housing Auth., 34 Marimac Rd., plans by Kane & Fairchild, 734 Asylum Ave., Hartford, 100-unit housing development. $1,000,000.

▲ **Conn., Stamford**—HOUSING—Stamford Housing Auth., 100 Myano Lane, plans by W. M., F. R. Ballard, 123 E. 77 St., New York, N. Y., housing development. $1,500,000.

▲ **Conn., Vernon**—HIGH SCHOOL—Town, Bd. Educ., plans by Jeter & Cook, 36 Pearl St., Hartford, 1 and 2 story high school, $2,000,000. Henri B. Van Zelm & Assoc., 1007 Farmington Ave., West Hartford, consult. engrs. Buck & Buck, 650 Main St., Hartford, engrs. CD 5/9.

▲ **Del., Wilmington** — PARKING—Wilmington Parking Auth., City Hall, plans by G. Morris Whiteside 2nd, Wm. G. Moeckel & Joseph E. Carbonell, Jr., 909 Tatnall St., Wilmington, 4 story, 300-car concrete, steel auto parking bldg. and store, $2,000,000. Wilbur Smith & Assocs., 265 Church St., New Haven, Conn., consult. engrs. CD 10/24/52.

▲ **Ill., Belleville**—CITY HALL—City, H. V. Calhoun, mayor, city hall. $1,000,000 bond election July 31, 2 story, bsmnt., city hall, North Illinois and Washington St., fire station, Jackson St. Charles E. King, 19 A N. Illinoise Ave., archt. CD 12/27/54.

▲ **Ind., Mishawaka**—SCHOOL—Penn Twp. School, 117 Lincoln E., plans by Charles W. Cole & Son, 220 W. LaSalle St., South Bend, high school bldg., $2,000,000.

▲ **Mass., Ayer**—SCHOOL—Regional High School Planning Comm., regional high school for towns of Ayer, Shirley and Groton, $2,300,000.

▲ **N. J., Atlantic Highlands**—SCHOOL—Bd. Educ., Atlantic Regional School Dist., regional high school to serve Atlantic Highlands, Highlands, Keansburg, Raritan Twp. and Union Beach. $2,000,000.

▲ **N. J., East Brunswick**, (P. O. Old Bridge)—SCHOOL—Bd. Educ., East Brunswick Twp., plans by Epple & Seaman, 901 Broad St., Newark, Junior High School, Cranberry Rd., $1,500,000, 16 to 18 room school, Madison Park section of Township, $500,000.

▲ **N. C., Fayetteville**—SCHOOLS—Bd. Comrs., Cumberland Co. R. E. Nimocks, clk. to Bd., Fayetteville, voted bonds May 26, new schools and addns. $4,000,000. CD 6/25/52.

▲ **N. C., Raleigh**—DORMITORY—State, men's dormitory, at North Carolina State College. $2,000,000.

▲ **Pa., Harrisburg**—PATIENTS—General State Auth., 18 and Herr Sts., patients' bldg. at Harrisburg State Hospital, $1,920,000, A. F. Jones, ch. engr. CD 2/10/47.

▲ **Tex., Brownsville** — POWER PLANT — City, electric power plant. $2,300,000. Black & Veatch, Woods Chapel Rd., Kansas City, Mo., consult. engr. CD 6/1.

▲ **Tex., Deer Park**—HIGH SCHOOL—Deer Park Independent School Dist., plans by Emory S. White and Arne G. Engberg, M & M Bldg., Houston, high school. $1,115,796. CD 11/18/54.

▲ **Tex., Ft. Worth**—COURTHOUSE—Tarrant Co., c/o Gus Brown, judge, plans by Wyatt C. Hedrick Co., 1200 T & P Bldg., 5 story, red granite, sandstone and aluminum concrete, etc. courthouse addns., with ramp to connect with old courthouse air-conditioned. $2,400,000. CD 4/4.

▲ **Tex., Houston**—SCHOOL—Houston Independent School Dist., 1300 Capitol, voted bonds June 2, Durkee area Jr. High School, $2,250,000; Burris-Whittier School, $2,750,000; ... Sr. High School, $3,100,000; stadium, $1,750,000. E. O. Smith Area Jr. High School, $2,500,000, Tanglewood Jr. High School, $2,500,000; Meyerland (Sec. 3) Jr. High School, $2,000,000; White Oak Bayou (34th St. area) High School, $1,875,000; Westheimer and Ulrich Roads Sr. High School, $1,750,000; Blackshear area Elementary School, $1,000,000; Willow Elementary School, $1,250,000; Blueridge Elementary School, $750,000; Briargrove Elementary School, $1,100,000; Elementary School, north of Dogan St., $675,000; Cloverland Elementary School, $650,000; Inwood Terrace Elementary School, $1,250,000; Meadow Creek Elementary School, $975,000; Glenbrook Valley Elementary School, $775,000; Rusk area Elementary School, $800,000; Meyerland, Sec. 2, Elementary School, $1,200,000; Lamar Terrace Elementary School, $1,050,000; Sunnyside Elementary School, $900,000.

▲ **Tex., Houston**—HIGH SCHOOL—Houston Independent School Dist., 1300 Capitol St., plans by H. Voelker & Assocs., 1202 Dennis St., and Milton McGinty, 2425 Ralph St., Yates area Senior High School, 2600 Blk. Elgin St. $2,500,000. Chas. V. Chenault, 1202 Dennis St., George Smith, 616 Cortlandt St., consult. engrs. CD 7/30/54.

▲ **Tex., San Antonio**—HOUSING—San Antonio Housing Auth., 400 Labor St., Tex. 6-16, 150 housing units for Negroes adjacent to East Terrace Courts, E. Commerce St. $1,800,000; (Tex. 6-17) 115 housing units, West Side, Menchaca Homes at W. Poplar and N. W. 26 St. $1,380,000; (Tex. 6-18) 75 housing units for Victoria Courts, $937,500, CD 10/24/49; Tex. 6-15, 150 housing units for aged people, $1,800,000. CD 5/7/52; (Tex. 6-14) 40 housing units for Negroes adjacent to Sutton Courts, $480,000. CD 3/31/52.

▲ **Va., Arlington**—COURT HOUSE—Arlington Co., Court House, voted bonds June 5, county court house imprvs. $2,200,000. CD 5/11.

▲ **Va., Arlington**—SCHOOL—Arlington Co., Court House, voted bonds June 5, school constr. $4,500,000. CD 5/11.

▲ **Ont., Cornwall**—HOSPITAL—Cornwall General Hospital, hospital wing, 70 beds, $2,200,000. Agnew, Craig & Peckham, 200 St. Clair Ave. W., Toronto, consult. engrs. CD 10/17/51.

▲ **Ont., Toronto**—HOUSING—Housing Authority of Toronto, City Hall, plans by J. E. Hoare, Jr., 481 Eglinton Ave. W., 12 storys for elderly persons, 118 one-bedroom and 47 bachelor suites, Regent Park Housing development addn. $1,425,000.

COMMERCIAL BUILDINGS

▲ **Calif., Torrance**—DWELLINGS—R. A. Watt Constr. Co., 7862 S. Western Ave., Los Angeles, 233 frame, stucco dwellings, 173 at 186 St. and Prairie Ave. and 60 at 182 St. and Arlington Ave. $2,500,000.

▲ **Calif., Van Nuys**—DWELLINGS—Hirsh-Edmunds Bldg. Co., 246 S. Robertson Blvd., Beverly Hills, 142 frame, stucco dwellings, Corbin and Victory Sts. $1,698,400.

▲ **Conn., Bridgeport**—DORMITORIES, etc.—University of Bridgeport, 200 Park Pl., 2 dormitories for 300 women students, cafeteria for 700, alter existing women's dormitories for male students, $1,300,000. CD 5/6/50.

▲ **Conn., West Hartford** — INFIRMARY — Sisters of Mercy, plans by Polak & Sullivan, 1397 Chapel St., New Haven, 2 story, bsmnt., infirmary. $1,500,000.

▲ **Conn., Stamford**—APARTMENT—Herman Glickman & Son, 19-31 Mott Ave., Far Rockaway, N. Y., plans by Schuman & Lichtenstein, 369 Lexington Ave., New York, N. Y., garden-type apartment, incl. 170 units, Linde House, Hope St. and Glenbrook Rd. $2,000,000.

▲ **Ill., Aurora**—HOMES, etc.—Edgelawn Terrace Ltd., 1006 Lebanon, 100 homes, sewers, curbs, gutters and blacktop, Galena and Illinois Sts. $1,650,000.

▲ **Ill., Quincy**—SHOPPING CENTER—Don M. Casto Developers, 42 S. 4 St., Columbus 15, O., shopping center, 30 to 40 units of varying sizes and parking facilities for 2500 cars on Route 104, eastern edge of city. $4,000,000.

▲ **Ky., Ryland**—HOME—Chester Coppage, Taylor Mill Pk., Independence, 100 home project, off Decourcy Pk. $1,500,000 constr. late 1956.

▲ **Mich., Southfield**—OFFICE—Michigan Bell Telephone Co., 1365 Cass, Detroit, Zone 26, office bldg., Southfield Rd. and Northwestern. $1,500,000.

▲ **Mo., St. Louis**—OFFICE—Harold W. Dubinsky & Melvin Dubinsky, 701 Chestnut St., Zone 1, one or two modern office bldgs. on 315x467 ft. site on Oakland Ave., vicinity of Macklind Ave. $1,000,000. May build late 1956.

▲ **Neb., Omaha**—HOTEL—R. W. Dillon, 3420 Jones St., expansion of Town House Hotel. $1,000,000.

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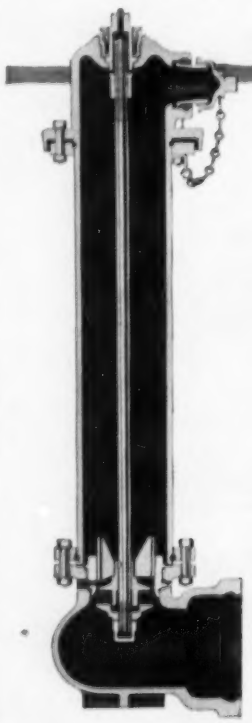

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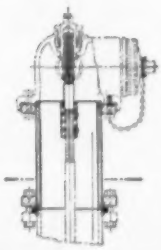

R. D. WOOD

Public Ledger Building, Independence Square
Philadelphia 5, Pa.

▲ **N. J., Edison**—HOUSING—Edison Housing Agency, 1036 Amboy Ave., Fords, 236 housing units, Potter's Crossing, Edison Twp. $1,065,000. Isidore Candeub, 359 S. Orange Ave., Newark, consult. engr.

▲ **N. J., Matawan**—HOMES—Paul Goldman & Saul Cantor, 101 Northwood Ave., Linden, plans by Irwin Gerber, 11 Commerce St., Newark, Zone 2, 500 home development to be known as Fleetwood Park, near Matawan in Raritan Twp., Middlesex Co. $7,000,000.

▲ **O., Brookville**—HOMES—Brainard Constr. Co., 2202 S. Patterson Blvd., Dayton, 74 brick homes, northwest Brookville. $1,000,000.

▲ **O., Youngstown** — HOUSING — Procurement Office, Youngstown Municipal Air Base, Youngstown, plans by Robert A. Little & Assoc., 1303 Prospect Ave., Cleveland, Zone 15, construct and finance 250 unit housing, to house personnel of the U. S. Air Force, Youngstown Municipal Airport. $2,500,000.

▲ **Pa., Homestead** — HOSPITAL — Homestead Hospital, 1800 West St., plans by Press C. Dowler, Century Bldg., Pittsburgh, 5 story brick, block, steel hospital addns. $1,500,000.

▲ **Tex., Abilene**—SHOPPING CENTER—J. J. Holmes, 816 E. 31, Austin, 270,000 sq. ft., masonry shopping center. 30 acre plot, in 804 acre tract, off Buffalo Gap Road. $1,800,000.

▲ **Tex., Ft. Worth**—OFFICE—Alex Hudson, Jr., c/o Mercantile Bank Bldg., Dallas, plans by Harwood K. Smith & Assocs., 921 Mercantile Bank Bldg., 5 story (ultimately 12 story) 90,000 sq. ft., stone, brick doctors' office concrete fdn. and frame, off 8th Blk. on 5th Ave., $2,000,000.

▲ **Wis., Milwaukee**—HOSPITAL—Milwaukee Children's Hospital, 721 N. 17th St., plans by Scott, Kloppenburg & Scott, 5623 N. Lake Dr., 6 story 65 bed hospital addn., remodel. $3,541,000.

▲ **Alta., Edmonton**—OFFICE—Northwestern Utilities Ltd., plans by Rule, Wynn & Rule, 11422 Jasper Ave., 8 story, bsmnt., steel, masonry office bldg. $3,000 000.

▲ **N. S., Halifax**—MOTHER HOUSE—Sisters of Charity, Mount St. Stephen, N. B., plans by Franco Consiglio, 272 Quinpool Rd., 2 or 4 story., each abt. 40x550 ft., six wings, connecting with chapel in center, concrete fdtns., structural steel frame, stone and brick exterior walls, mother house of religious order, $6,000,000. Tenders for fdns. in about 3 wks., and for superstructure, in September. Letendre, Monti & Assocs., 2175 Mansfield St., Montreal, Que., consult. engrs. CD 3/28.

▲ **Ont., Corunna**—RESIDENTIAL DEVELOPMENT—Custom Builders of Sarnia Ltd., Coronation Park, residential development, 1,000 houses. $2,000,000. To begin in fall.

▲ **Ont., Newmarket**—SHOPPING CENTER—Eagle Development Co., c/o engineers shopping center. $1,500,000. D. N. McIntosh, C. Moeller, W. Smale Assocs., 36 James St., S., Hamilton, Ont., consult. engrs. and archts.

▲ **Ont., Ottawa**—HOSPITAL—City, Civic Hospital Bd., Carling Ave., plans by Abra & Balharrie, 35 Metcalfe St., and Gilleland & Strutt, 304 Laurie Ave. W., hospital exten. on Carling Ave. (Pathology Bldg.) centre wing addn. to main bldg., west wing, east end, female help bldg., etc. $3,185,000. CD 11/9.

▲ **Ont., Toronto**—APARTMENT—Promenade Swiss Development Corp., 4 St. Thomas St., plans by Wilfred Shulman, 1173 Bay St., 14 story apartment, Broadview Ave. near Danforth Ave. $2,240,000.

▲ **Ont., Toronto**—APARTMENT—Allan Weber, 229 Yonge St., plans by Bregman & Hamann, 7 Adelaide St. E., 9 story, bsmnt., 53x200 ft. rein.-con, steel frame, masonry apartment and underground parking, $1,120,000.

▲ **Que., L'Annunciation**—HOSPITAL—Prov. Que. Health Dpt., Quebec City, mental hospital, 400-500 beds. $5,000,000.

▲ **Que., Roberval**—HOSPITAL—Prov. Que. Health Dpt., Quebec City, hospital. $4,000,000.

INDUSTRIAL BUILDINGS

▲ **Fla., Gainesville**—PLANT, etc.—General Electric Co., River Rd., Schenectady, N. Y., plans by Robert & Co., archts and engrs., 96 Poplar NW, Atlanta, Ga., 300,000 sq. ft. communications equipment plant, 10 miles N.W. of here. $4,000,000.

▲ **Ill., Morton**—WAREHOUSE, etc.—Caterpillar Tractor Co., 600 W. Washington St., East Peoria, approx. 800,000 sq. ft. warehouse and parts processing bldg. with office space, $10,000,000. F. R. Orr Constr. Co., 4414 Vine St., Denver 16, Colo., engrs.

▲ **Ind., Lafayette**—FACTORY—Eli Lilly & Co., 740 S. Alabama St., Indianapolis, chemical mfg. plant with 3 story manufacturing bldg., service bldg., warehouse, solvent recovery bldg., solvent incinerators, storage-tank area, waste treatment facility, adjoining Tippecanoe Laboratories, near here, $3,400,000.

▲ **Iowa, Burlington**—PLANT—General Electric Co., River Road, Schenectady, N. Y., branch plant for manufacture of appliance timers, $1,500,000.

▲ **Ky., Louisville**—LUMBER AND DISTRIBUTING YARD—Weyerhaeuser Timber Co., Tacoma Bldg., Tacoma, Wash., combination lumber and distributing yard, incl. 40,000 sq. ft. warehouse, 10,000 sq. ft. office, covered loading docks, 11,000 sq ft. storage shed, railroad trackage, etc. on Watterson Expressway between Preston Hy. and Poplar Level Rd. $1,000,000.

▲ **Mich., Dearborn**—LABORATORY—Ford Motor Co., 3000 Schaefer St., 1 story, brick, limestone propulsion laboratory at Ford Research & Engineering Center. $2,000,000.

▲ **O., Bellefontaine**—FACTORY—Delta Power Tool Div., Rockwell Mfg. Co., 662 N. Lexington Ave., Pittsburgh 8, Pa., 144,000 sq. ft. factory addn. $1,-000,000.

▲ **O., Toledo**—PLANT—Barrett Division Allied Chemical & Dye Corp., 2112 Sylvan, polyester resin and phenolic resin, addns. Glendale Ave. plant. $2,000,000.

▲ **Pa., Monroeville**—RESEARCH CENTER—Koppers Co., Koppers Bldg., Pittsburgh, Zone 19, plans by Vorhees, Walker, Smith & Smith, 101 Park Ave., New York, N. Y., research center, incl. laboratories, pilot plants, **power plant and administration** bldg. A. Chemical laboratory will be started next year. $10,000,000.

▲ **Ont., Toronto**—SERVICE STATION—Associated Taxicab Co-operative Ltd., c/o Diamond Cab Co., 251 Queen St. E., service station, co-operative for taxi owners, Over $1,000,000.

UNCLASSIFIED

▲ **Ala., Montgomery**—PARK, etc.—City, City Hall, park and recreation system addns. $1,255,000.

▲ **Ind., Evansville**—PARKING FACILITY—City, Mayor R. Vance Hartke, City Hall, parking facility and store bldg., on half block of Second St. downtown. $2,000,000.

▲ **Oklahoma**—CABLE—Southwestern Bell Telephone Co., 405 N. Broadway, Oklahoma City, 130 mi. underground cable from Oklahoma City to Kansas State Line. $2,000,000. CD 8/9/51.

▲ **Texas**—RURAL DISTRIBUTION LINES, etc.—Guadalupe Valley Electric Co-operative, Gonzales, sub-headquarters bldg., sys. imprvs., 132 mi. rural distr. lines, Gonzales, Wilson, Lavaca, Comal, DeWitt, Karnes, Guadlaupe and Bexar Counties. $1,145,000. REA allot. CD 12/30/54.

▲ **Tex., Brownsville**—POWER LINES—City, power lines, $1,000,000. Black & Veatch, Woods Chapel Rd., Kansas City, Mo., consult. engrs. CD 6/1.

▲ **Tex., Houston**—WHARF—Port Comn., c/o Wharf 3, constr. wharf 7. $1,000,000. Rob. J. Cummins, Bkrs. Mtg. Bldg., consult. engr. CD 4/29/54.

▲ **New Brunswick**—RAILWAY LINE—Canadian National Rys., Atlantic Region, G. R. Douil, regional ch. engr., Moncton, railway line, West from Bartibog to the Tofoganops River near little Rover Lakes $3,000,000.

▲ **Que., Quebec City**—WHARF—St. Lawrence Cement Co. Ltd., Box 1156, 6,600 ft. long wharf, at cement plant, $1,500,000. Foundation of Canada Engineering Corp. Ltd., 1980 Sherbrooke St. W., Montreal, consult. engrs.

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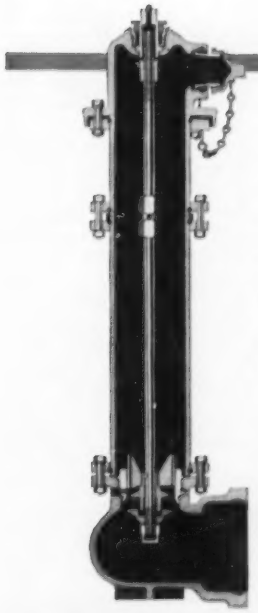
The R. D. Wood Standard Swivel Joint Hydrant is designed to provide maximum strength and reliability at lowest possible cost. Internal friction, which can lower pressure, is reduced to the minimum, well below A.W.W.A. specifications. Changes of diameter are carefully rounded and nozzleways are scientifically tapered.



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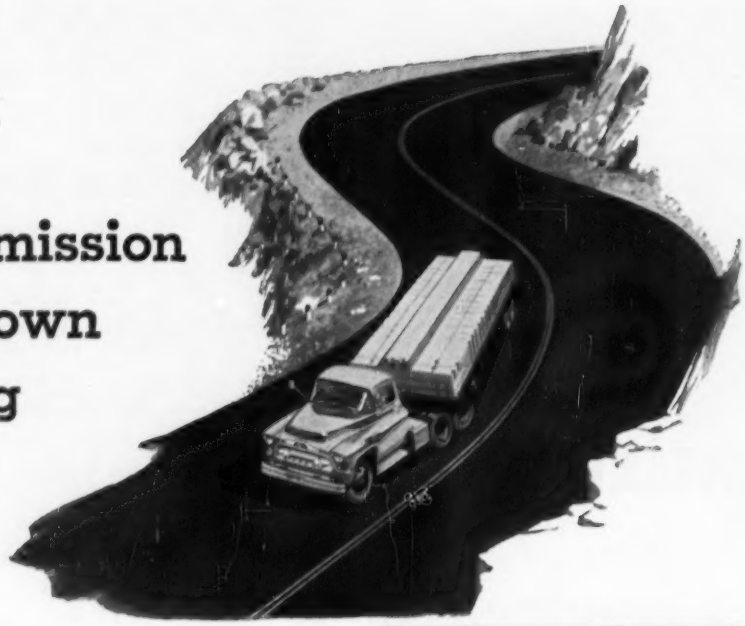

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Bids—Low Bids—Contracts—Second Section

NEW ENGLAND

HEAVY CONSTRUCTION—LB & CA

▲ **RHODE ISLAND**—State R. I. & Prov. Plants, Div. Purchase, State House, Providence,
Campanella & Cardi Constr. Co., 780 Jefferson Blvd., Warwick, R. I., LB **$1,206,686**. highway work, Louisquisset Pike-Urban Exten. from Admiral St. to Branch Ave. etc., Contr. 5606, FA Proj. F-035 (4), Providence. Bids June 13. CD 6/4.

BUILDINGS—LB & CA

▲ **Felix Buzzi & Son, Inc.**, 612 S. Main St., Torrington, Conn. LB **$3,375,000**. (7 bidders) central OFFICE, State Hy. Dpt. and Hy. Dist. I garage, WETHERSFIELD, CONN. State P. Wks. Dpt., 165 Capitol Ave., Hartford, Conn. Bids June 13. CD 5/16.

MIDDLE ATLANTIC

BUILDINGS—BA

▲ **Del., Wilmington**—PARKING—BA 9/21—Wilmington Parking Auth., City Hall, off-street parking bldg., Ninth and Shipley Sts. $2,000,000. Whiteside, Moeckel and Carbonell, 909 Tatnall St., archts. CD 6/8.

HEAVY CONSTRUCTION—LB & CA

▲ **C. E. Knowles Co.**, Industrial Pl., Gowanda, N. Y. LB **$1,492,250**. (2 bidders) enlargement and modernization of sewage plant, LACKAWANNA, N. Y. City, City Hall, Lackawanna, N. Y. Nussbaumer, Clarke & Velzy, 327 Franklin St., Buffalo 2, N. Y., engrs. CD 11/16/51.

▲ **Buckley & Co., Inc.**, 1317 S. Juniper St., Phila., Pa. LB **$810,174**. sewers, Bid 2594, PHILA., PA. City, Dpt. Procurement, City Hall Annex, Phila., Pa. Bids June 5. CD 5/4;
A. J. Ellis Constr. Co., Fourth and Courtland Sts., Phila., Pa. LB **$374,150**. sewers, Bid 2601. (Phila., Pa.);
C B Constr. Corp., 1121 Frankford Ave., Phila., Pa. LB **$1,192,908**. sewers, Bid 2600. (Phila., Pa.).

BUILDINGS—LB & CA

▲ **Jonn Kennedy**, 205 E. 42 St., New York, N. Y. CA **$1,427,700**. general constr., Junior High SCHOOL, BAY SHORE, N. Y. Bd. Educ., South Country Elementary School, Bay Shore, N. Y. Bids May 15. Grand total $2,371,689. CD 4/13;
Reader Green, 1 Sunrise Plaza, Valley Stream, N. Y. CA **$599,989**. general constr. South Country SCHOOL. (Bay Shore, N. Y.);
John B. Dietze, Inc., 135-39 Northern Blvd., Flushing, N. Y. CA **$344,000**. combined bid for heating and ventilating work. (Bay Shore, N. Y.).

▲† **Malan Constr. Corp.**, 2 Park Ave., New York 16, N. Y. CA **$5,141,879**. MEDICAL RESEARCH CENTER, at Brookhaven National Laboratory, incl. 1 story, 58,000 sq. ft. research laboratory, 1 story, 45,000 sq. ft. research hospital, 7,000 sq. ft. industrial facilities, reactor bldg., exten. of distr. sys. for power, water, heat, sewerage, necessary site work, etc. BROOKHAVEN, N. Y. Atomic Energy Comn., 1901 Constitution Ave. N. W., Wash., D. C. CD 5/10, under LB.

▲ **Caye Constr. Corp.**, 356 Fulton St., Brooklyn 1, N. Y. LB **$1,624,000**. (8 bidders) general constr., STOREHOUSE and bakery bldg. 102, Central Islip State Hospital, CENTRAL ISLIP, N. Y. Bureau Contracts & Accounts, The Gov. Alfred E. Smith State Office Bldg., Albany, N. Y. Bids June 7. CD 3/9/55.

▲ **John W. Cowper Co.**, 775 Main St., Buffalo 3, N. Y. CA **$1,920,000**. Alice Statler AUDITORIUM and Statler Hall alterations, addns., ITHACA, N. Y. Cornell University, Ithaca, N. Y. Bids May 12. CD 5/4.

▲ **Edward & Lawrence P. Marron & Co.**, 55 Franklin Ave., Ridgewood, N. J., Own Forces. **$4,500,000-$5,000,000** 300-unit APARTMENT, Rte. 17 and Boroline Rd., ALLENDALE, N. J. Carl K. Loven, 119 Rock Rd., Glen Rock, archts.

H. J. Fox, c/o Foxwood Homes, Inc., Rte 35, Hazlet, N. J. Owner Builds. **$3,500,000**. Foxwood SHOPPING CENTER, Rte. 35 and Hazlet Ave., HAZLET, N. J. Herbert Tannenbaum, 205 E. 43 St., New York, N. Y., archt.

▲ **J. C. Breyfogle**, 74 E. Gay St., Columbus, O. CA **$6,000,000**. Trenton Lake SHOPPING CENTER, Lawrence Twp., LAWRENCEVILLE, N. J. J. C. Breyfogle, 74 E. Gay St., Columbus, O. and Garfield Assocs., 24 Commerce St., Newark, N. J. Milosevich & Trautwein, 3391 N. High St., Columbus, O., archts.

▲ **John Cali & Bros.**, Grove Ave., Morris Plains, N. J. Owner Builds. **$1,000,000**. 41 HOMES, Grove Ave. off Mountain Way, to be known as "Holiday Ridge", MORRIS PLAINS, N. J. Stephen Potter, 410 Colonial Ave., Union, archt.

▲ **Hall Constr. Co.**, c/o Harry Sherman, 62 William St., New York, N. Y. Owner Builds. **$4,500,000**. 265 HOMES, Old Bridge Pike, East Brunswick Twp. to be known as "Hallmark Development", NEW BRUNSWICK, N. J. Frederick Harsen, Railroad and Summit Ave., Tenafly, archt.

▲ **Refinery Engineering Co.**, (Div. Vitro), Wright Bldg., Tulsa, Okla. CA Est. over **$1,000,000**. primary uranium processing PLANT, CANNONSBURG, PA. Vitro Rare Metals Co., Div. Vitro Corp. of America, 261 Madison Ave., New York 16, N. Y. Vitro Engineering Div., 261 Madison Ave., New York 16, N. Y., engr.

▲ **Whitehall Manor Homes, Inc.**, c/o Abe Toll, William E. Wills, King of Prussia, Pa. Separate Contracts. **$1,800,000**. RESIDENTIAL DEVELOPMENT, Hughes Park sect., GULPH MILLS, PA. H. O. Krasnoff, 415 Church Rd., Elkins Park, archt.

▲ **Wigton Abbott Corp.**, 1225 South Ave., Plainfield, N. J. CA Est. **$1,500,000**. 4 story, 52x227 ft., brick, steel RESEARCH CENTER, HARMARVILLE, PA. Gulf Research & Development Corp., Harmarville, Pa. CD 9/28/55.

▲ **John McShain, Inc.**, 17 and Spring Garden Sts., Phila., Pa. LB **$1,062,000**. Law School DORMITORY, PHILA., PA. University of Pennsylvania College Hall, 34 St. and Woodland Ave., Phila., Pa. Bids June 5. CD 5/24.

▲ **Warren B. Zorn**, Franklin Apartments, Pottstown, Pa. CA **$1,165,364**. general constr., 1 and 2 story, brick, junior-senior high SCHOOL, SANATOGA, PA. Pottsgrove School Auth., Sanatoga, Pa. CD 5/24, under LB.

▲ **Crump, Inc.**, 4031 Bigelow Blvd., Pittsburgh, Pa. CA Est. **$1,000,000**. superstructure, 1 story, 229x260 ft., steel P.W.R. Reactor PLANT, SHIPPINGPORT, PA. Westinghouse Electric Corp., Atomic Power Div., 3 Gateway Center, Pittsburgh, Pa. Stone & Webster Engr. Corp., 49 Federal St., Boston, Mass., archt. Bids May 24. CD 5/2.

▲ **John McShain, Inc.**, 1501 N. Arlington Ridge Rd., Arlington, Va. LB **$8,247,000**. general constr. INSTITUTION for defective delinquents, WILKES-BARRE, PA. General State Auth., 18 and Herr Sts., Harrisburg, Pa. Bids June 13. CD 5/22;
Gus Weinberger Co., Old Forge, Pa. LB **$764,000**. heating work. (Wilkes-Barre, Pa.);
Daniel J. Keating Co., 3917 Baring St., Phila., Pa., LB **$565,565**. power plant; LB **$945,000**. plumbing work. (Wilkes-Barre, Pa.);
Ross Electrical Constr. Co., Inc., 106 Fairmount Ave., Phila., Pa. LB **$1,154,000**. electrical work. (Wilkes-Barre, Pa.).

▲ **John H. McClatchy Corp.**, 69 and Market Sts., Upper Darby, Pa. Separate Contracts, Est. **$10,000,000**. DEPARTMENT STORE and Parketeria, UPPER DARBY, PA. Raymond Loewy, 488 Madison Ave., New York, N. Y., assoc. archt. Gimbel Bros., Inc., Eighth and Market Sts., Phila., Pa., Lessee. CD 2/23.

▲ **Novak, Sills & Novak**, 1012 14 St., N. W., Wash., D. C. Owner Builds. Est. **$1,428,000**. 68 HOMES on Wilson Lane, BETHESDA, MD. Santmeyer & Thomen, 2209 L St. N. W., Wash., D. C., archts.

(Continued on page 105)

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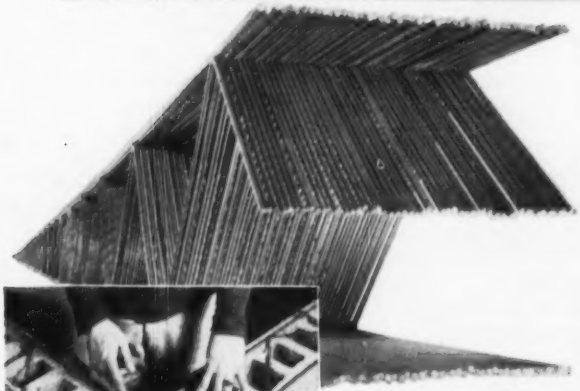

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▲† Victor R. Beauchamp, Inc., 431 Cedar St. N. W., Wash., D. C. LB $1,293,490. Item 1, $1,278,490. Item 2; (9 bidders) explosive ordnance disposal SCHOOL, U. S. Naval Powder Factory, NOY 92003, INDIAN HEAD, MD. Dist. P. Wks. Office, Potomac River Naval Command, Naval Gun Factory, Wash., D. C. Bids June 13. CD 5/18.

▲ Vincent Dangler & Joseph Setlerine, 7292 Central Ave., Seat Pleasant, Md. Owner Builds. $11,000,000. 900 HOMES known as Peppermill Village, SEAT PLEASANT, MD. Edwin S. Voorhis & Son, Inc., 2100 New York Ave., Huntington Station, N. Y., engr. CD 6/13, under CA.

SOUTH

BUILDINGS—BA

▲ N. C., Fort Bragg—HOUSING—BA About 7/26—U. S. Eng., 308 Customhouse, Wilmington, construct and finance, Capehart Family Housing II, Eng. 31-075-56-74. CD 2/26/51, under Public Buildings.

HEAVY CONSTRUCTION—LB & CA

▲ City, City Hall, Charlotte, N. C., rejected bids May 29, Contr. 2, general constr., LB $4,675,000; Contr. 4, plumbing, LB $45,185; Contr. 5, heating, ventilating, air-conditioning, LB $93,546 for Hoskins Filtration Plant, CHARLOTTE, N. C. CD 6/7, under LB.

▲† A. B. Newton & Co., Vidalia, Ga., CA $1,016,865. junior officers' quarters and married enlisted men's quarters, Naval Air Station, NBy 829, BRUNSWICK, GA. Dpt. Navy, P. Wks. Office, Naval Base, Charleston, S. C. Bids Apr. 19. CD 5/1, under LB.

BUILDINGS—LB & CA

▲ Snell Constr. Co., Frank J. Murphy Jr., Inc., Preston Constr. Corp., 415 S. Glebe Rd., Arlington, Va. Owner Builds. $3,000,000. 318-unit APARTMENT, two swimming pools, 6.37 acres. 1200 South Courthouse Rd., ARLINGTON, VA. J. Fitzsimmons, 1731 New Hampshire Ave., N. W., Wash., D. C., archt.

▲ J. W. Bateson, Inc., Gibraltar Life Bldg., Dallas, Tex., LB $6,281,000 (8 bidders) construct and finance, Capehart Family HOUSING, 121 bldgs., 2 to 8 units each for total of 525 units, off site utilities and imprvs. Fort Lee-Richmond Quartermaster Depot 1, ENG-44-110-56-28, FORT LEE, VA. U. S. Eng., foot of Front St., Norfolk 1, Va. Bids June 13. CD 5/28.

▲ H. L. Coble Constr. Co., 1705 Battleground Ave., Greensboro, N. C. CA $3,497,400, construct and finance, 284 units Capehart HOUSING. ENG-31-075-56-51. FORT BRAGG, N. C. U. S. Eng., 308 Customhouse, Wilmington, N. C. Bids May 10. CD 5/15, under LB.

▲ Brice Building Co., Inc., 1021 2nd Ave. N., Birmingham, Ala. LB $1,297,991. (4 bidders) women's DORMITORY on new campus at Homewood, BIRMINGHAM, ALA. Howard College, 7725 2nd Ave. S., Birmingham, Ala. Bids June 7. CD 5/23; Daniel Constr. Co., Inc., 822 7th Ave. S., Birmingham, Ala. LB $1,046,124. (4 bidders) men's dormitory on new campus, Lakeshore Dr. Homewood (Birmingham, Ala.).

▲ E. E. Farrow Co., 109 W. Levy St., Irving, Tex. CA $1,462,980. municipal POWER PLANT and equip., ALEXANDRIA, LA. City, Alexandria, La. Bids June 4, awarded June 6. CD 6/12, under LB.

▲ Foster Wheeler Corp., 165 Broadway, New York 6, N. Y. CA Est. $15,000,000. design and construct 300 ton per day ammonia synthesis PLANT, LAKE CHARLES, LA. Petroleum Chemicals, Inc., (Continental Oil Co. and Cities Service Co.), Lake Charles, La. CD 3/22.

MIDDLE WEST

BUILDINGS—LB & CA

▲ Algernon Blair, Inc., 1st Natl. Bank Bldg., Montgomery, Ala., CA Est. $4,000,000. 273 HOMES, 70-acre site, adjoining J. Edw. Good Park Golf course, at western end of Delia Ave., AKRON, O. Delia Estates, Inc., subsidiary of Algernon Blair, Inc., 1st. Natl. Bank Bldg., Montgomery, Ala.

▲ Koppers Co. Inc., Koppers Bldg., Pittsburgh 19, Pa. CA Est. $20,000,000. Design and Construct, rebuilding COKE OVEN BATTERY with auxiliary equip. CLEVELAND, O. Republic Steel Corp., Republic Bldg., Cleveland 15, O. CD 5/31.

▲ Grant-Halladay Constr. Co., Callahan Bldg., Dayton, O. Owner Builds. $4,000,000. 300 HOMES, fourth sect. of Newcom Plat, east of here, north side Dorothey Lane, between County Line Rd. and Newcom Knolls, DAYTON, O. CD 11/29/54.

▲ Fred Teitelbaum Constr. Co., 5526 N. Kedzie Ave., Chicago, Ill., CA $2,500,000. WAREHOUSE, FACTORY, office, 25 Ave. and Division St., MELROSE PARK, ILL. Reflector Hardware Corp., 2245 S. Western Ave., Chicago, Ill. Bids May 8. CD 4/26.

▲ Evans Constr. Co., 1900 E. Washington St., Springfield, Ill. CA $2,302,087, Memorial HOSPITAL addn., SPRINGFIELD, ILL. Memorial Hospital of Springfield, Inc., 1 and Miller Sts., Springfield, Ill. Bids May 22. CD 4/17.

▲ A. F. Burchard, 17800 Chester St., Detroit, Mich. Owner Builds. $4,800,000. East Pointe Estates incl. 240 ranch HOMES, Marter Rd., GROSSE POINTE SHORES, MICH.

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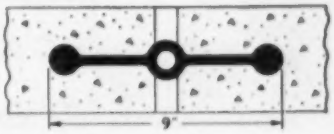
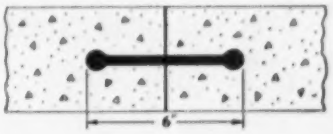
HOLLOW BULB—FOR EXPANSION JOINTS

Insures permanent, watertight seals in joints where considerable movement due to expansion and contraction is expected. Flexible and elastic with a very high degree of tensile strength to withstand both lateral and shearing movement. Widths—6" and 9" . . . lengths to order.



FLAT DUMBBELL—FOR CONTRACTION OR EXPANSION JOINTS

Made of durable, elastic cured rubber which has high tensile strength and flexibility for effective sealing of contraction and expansion joints against hydrostatic pressure. Carefully manufactured to insure dense, homogeneous cross section for greatest service life. Widths—6" and 9" . . . lengths to order.



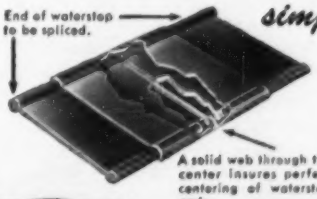
SPLIT TYPE WATERSTOP

faster, easier installation

A new Servicised development already in wide use because it reduces installation time and cost by eliminating splitting of form. One half of width is split to permit fastening to inside of bulkhead in the form of a "T." After section is poured, form is removed and divided sections are joined together by stapling. Pat. Pend.

WATERSTOP UNION

simplifies Field Splicing



Permits a faster, simpler method of field splicing, using only rubber cement. The union is hollow and is made from rubber meeting the same specifications as the waterstop. Available for splicing 6" and 9" Dumbbell and 6" and 9" Hollow Bulb Waterstops. Pat. Pend.

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In planning a 340-pupil elementary school on a 13-acre site at Holden, Mass., the School Building Committee had to know two things, quickly. First, was there enough overburden on the site to fill and reclaim an existing swamp? Second, would bedrock be encountered within the 30-foot depth required for grading operations? The presence of many boulders in this glacial till area complicated any boring program. On May 9, 1955 a Gahagan Seismic Survey Crew started work. On that one day, using portable equipment, they completed 1,320 linear feet of subsurface profile. Gahagan's report showed that enough overburden did exist to fill the swamp, and that bedrock would not be encountered down to minus 30 feet. Subsequent actual excavation confirmed these findings. For the full story about seismic surveys, write on your letterhead for Bulletin 1 to Geophysical Division, Gahagan Dredging Corporation, 90 Broad St., New York 4, N. Y.

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GAHAGAN
CASE HISTORY

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▲ **Austin Building Co.,** 26275 12 Mile Rd., Southfield, Mich. CA **$2,800,000.** Brookland Farms Development incl. 140 brick HOMES, Nine Mile Rd. and Novi Rd., NORTHVILLE, MICH. Fred Blackwood Co., 627 S. Hunter Blvd., Birmingham, Mich.

WEST OF MISSISSIPPI

BUILDINGS—LB & CA

▲ **Kraus-Anderson, Inc.,** 501 S. Eighth St., Minneapolis, Minn. CA **$1,024,143.** general constr., 4 story HOSPITAL addn., MINNEAPOLIS, MINN. Fairview Hospital, C. Platou, administrator, 2312 S. Sixth St., Minneapolis, Minn. CD 6/12, under LB.

▲ **Watson Constr. Co.,** Baker Bldg., Minneapolis, Minn. LB **$1,023,000.** (3 bidders) general constr., 2nd-unit Northeast Junior High SCHOOL between 29 and 30 Aves. and between Hayes and Garfield Sts., MINNEAPOLIS, MINN. Bd. Educ., G. R. Arneson, city purch. agt., City Hall, Minneapolis, Minn. Bids June 8. CD 5/17.

▲ **Fruin-Colnon Contg. Co.,** 1706 Olive St., St. Louis 3, Mo. CA Est. **$1,750,000.** 9 story, 40x50 ft. HOTEL ADDN. connecting Chase Hotel and former Chester Apartments and 1 story, bsmnt. 112x154 ft. addn. for ballroom in rear of hotel, ST. LOUIS, MO. Chase Hotel, Inc., Harold Koplar, pres., 212 N. Kingshighway Blvd., St. Louis 8, Mo. Ketchum & Konkel, 1090 Fox St., Denver, Colo., engrs. CD 5/14.

▲ **Centex Constr. Co.,** 4606 Greenville St., Dallas, Tex. Own Forces. **$373,110,** 32 DWELLINGS; **$393,336,** 40 dwellings; **$381,000,** 38 dwellings, in Oak Cliff, DALLAS, TEX. Grand total $1,147,446. CD 4/18.

▲† **King Constr. Co.,** Box 39, Texarkana, Tex., LB **$1,211,524.** AMMUNITION RENOVATION facilities, Second Increment, Red River Arsenal. ENG-34-066-56-48. TEXARKANA, TEX. U. S. Eng., Box 61, Tulsa 2, Okla. Bids June 6. CD 5/24.

FAR WEST

HEAVY CONSTRUCTION—LB & CA

▲† **Clyde W. Woods & Sons, Inc.,** Box 620, North Hollywood, Calif., CA **$1,462,710.** est. $2,500,000. Los Angeles River Imprv., Atlantic Ave. to 63 St., Maywood, CIVENG-04-353-56-62, CALIFORNIA. U. S. Eng., 751 S. Figueroa St., Los Angeles, Calif. Bids May 16, awarded May 28. CD 5/18, under LB.

▲† **Schutt Constr. Co. Inc.,** Springfield, Ore., LB **$1,144,000.** est. $1,875,000. (9 bidders) clearing reservoir area for Monticello Dam, Napa and Yolo Counties. CALIFORNIA, Bureau Reclamation, Dpt. Interior, Winters, Calif. Bids June 7. CD 5/16.

▲† **Bureau Reclamation, Dpt. Interior,** Lindsay, Calif., rejected bids May 8, Shafter-Wasco Laterals and sublaterals, Unit 1, Lateral 134.4, Station 249 plus 54.67 to Station 573 plus 19.30 and sublaterals for lateral 134.4 feeder main, Shafter-Wasco Irrigation Dist., Friant-Kern Canal Distribution Sys., Central Valley Proj., CALIFORNIA. LB **$2,805,103.** CD 5/14, under LB.

BUILDINGS—LB & CA

▲ **Dorland Constr.,** 1309 Jefferson St., Salt Lake City, Utah. LB **$1,037,617,** est. $700,000-$900,000. HOSPITAL ADDN., PRICE, UTAH. Carbon Co. and City of Price, Price, Utah. Bids May 24. CD 5/17.

▲ **H. Valle Co.,** 413 3 Ave. W., Seattle, Wash., CA **$1,698,950,** general constr. Jefferson Park HIGH SCHOOL, SEATTLE, WASH. School Dist. No. 1, 815 4th Ave. N., Seattle, Wash. Bids June 6, awarded June 8. CD 6/11, under LB;
G. H. Lucken, 922 Leary Way, Seattle, Wash., LB **$395,120,** mechanical work for Jefferson Park High School (Seattle, Wash.).

▲ **Smith-Phillips Co.,** 7402 S. W. Macadam Ave., Portland, Ore. CA **$1,076,501.** HIGH SCHOOL, ASTORIA, ORE. Astoria School Dist., Astoria, Ore. Bids May 25., awarded June 8. CD 6/5, under LB.

▲ **Spiering Homes,** 76 Sunny Brae, Arcata, Calif. Owner Builds. **$4,250,000. HOMES, Sub-division** in Hunter Creek and Minot Creek areas, NORTH KLAMATH, ORE.

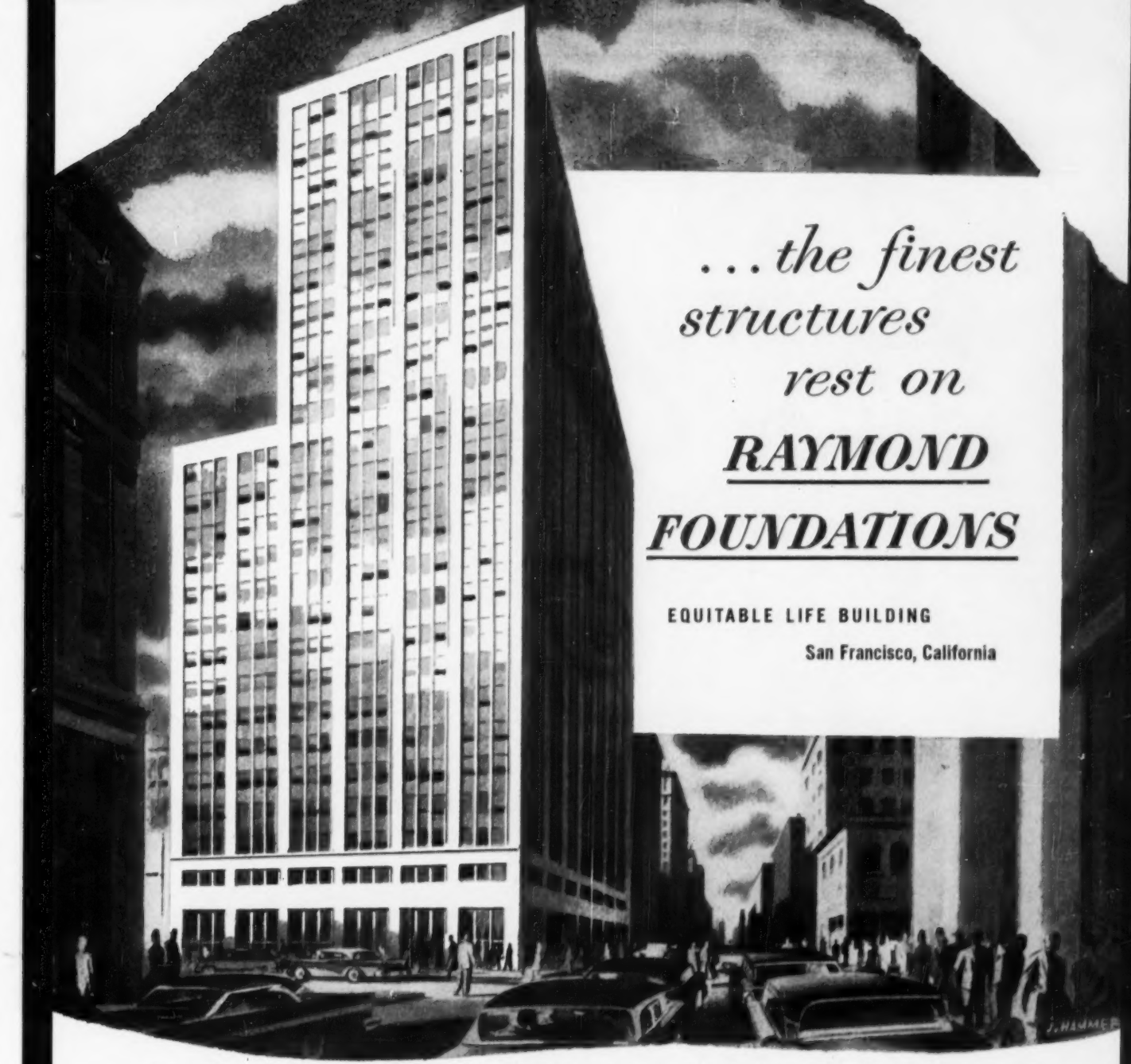
▲ **R. R. Hensler,** 7550 Wheatland St., Sun Valley, Calif. CA **$1,666,455,** est. $2,000,000. excavate steam plant site and imprv. Vista Del Mar and Coast Blvds., El Segundo, LOS ANGELES, CALIF. City, Bd. P. Wks., City Hall, Los Angeles, Calif. Bids Apr. 4, awarded June 1. CD 4/6, under LB.

▲ **Fluor Corp., Ltd.,** 2500 Atlantic St., Los Angeles, Calif., CA Est. **$2,500,000.** Design and construct, 2nd unit 60,000 kw steam electric GENERATING PLANT, San Bernardino Steam Plant, SAN BERNARDINO, CALIF. California Electric & Power Co., 3771 W. 6 St., Riverside, Calif. CD 11/21/55.

▲ **Associated Constr. & Eng. Co.,** 2903 Geneva Ave., San Francisco, Calif., CA, **$1,500,000,** 1 story, 425x700 ft. tilt-up rein.-con. paper container PLANT, State Hy. 68 and Tanner Lane, SAN JOSE, CALIF. International Paper Co., 220 E. 42 St., New York, N. Y., David R. Edwards, 5911 Pine Ave., Maywood, engr.

▲ **Barrett Constr. Co.,** 1800 Evans Ave., San Francisco, Calif. CA **$1,391,000.** Sheriff's OFFICE and county jail, SAN JOSE, CALIF. Santa Clara Co., Court House, San Jose, Calif. Bids May 24. CD 6/1, under LB.

▲ **Carl N. Swenson Co., Inc.,** 1095 Stockton Ave., San Jose, Calif., CA **$2,218,000,** 4 story CITY HALL, SAN JOSE, CALIF. City, City Hall, San Jose, Calif. Bids June 4. CD 6/7, under LB.



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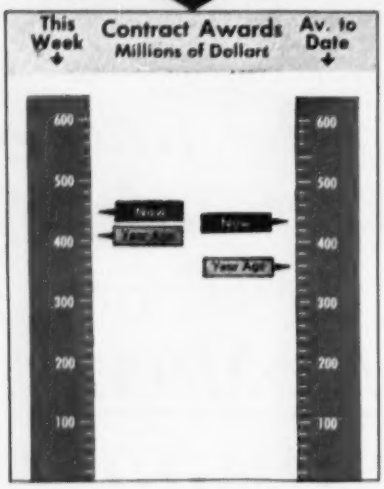
Construction Scoreboard

Activity this Week



AMOUNT OF CONTRACTS LET

By Ownership	This Week	1956	Cum. 25 wks Chge %
	$ millions		
Federal	$24.8	$856.0	+2
State and Municipal	113.2	3,052.4	+21
Total Public	138.0	3,908.4	+16
Total Private	305.5	7,038.9	+25
U. S. Total	$443.5	$10,947.3	+22
By Type of Work			
Waterworks	$11.1	$151.5	+24
Sewerage	7.6	298.1	+55
Bridges	6.5	301.3	+33
Highways	42.9	1,139.3	+13
Earthwork, Waterways	5.5	312.2	+17
Buildings:			
Public, Excl. Hosg.	46.9	967.9	+21
Public Housing	1.2	174.1	+29
Private Housing	168.0	2,952.6	−10
Commercial	50.3	940.1	+18
Industrial	82.6	2,785.1	+130
Unclassified	20.9	925.1	− 3
U. S. Total	$443.5	$10,947.3	+22

NOTE: Minimum size projects included are: Waterworks and waterways, $44,000; other public works, $73,000; industrial buildings, $93,000; other buildings, $344,000.

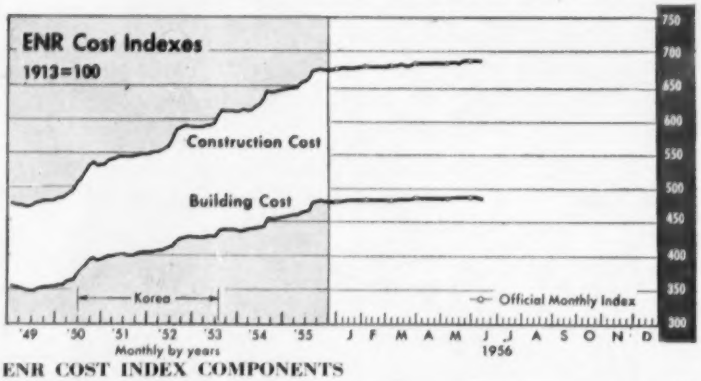
NEW CAPITAL FOR CONSTRUCTION

	Week of June 14	1956	Cum. 24 wks Chge '55-'56 %
	$ millions		
Corporate Securities	$179.5	$2,083.3	+29
State and Municipal:			
All Except Housing	133.1	2,198.0	+12
Housing	0.3	20.6	−55
Federal Loans	...	64.8	+23
Federal Aid	100.0	100.0	+5
Total Nonfederal	$412.9	$4,466.7	+18
Federal Appropriations:			
In U. S.	$24.2	$58.6	−1
Outside U. S.	...	...	...
Total New Capital	$437.1	$4,525.3	+18

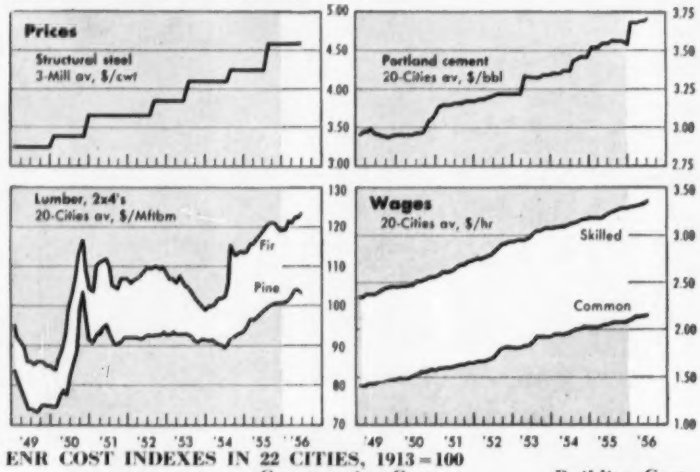
Cost Indexes as of Now

ENR INDEXES (1913 = 100), 20-cities' average	Week of June 14, 1956	% Change from May 17, 1956	% Change from June 16, 1955
Construction Cost	692.52	+0.6	+5.2
Building Cost	488.38	+0.1	+4.7

To convert above indexes to 1926 = 100: Divide Construction Cost by 2.080; Building Cost by 1.845.
1949 = 100: Divide Construction Cost by 4.770; Building Cost by 3.518.



ENR COST INDEX COMPONENTS



ENR COST INDEXES IN 22 CITIES, 1913 = 100

City	Construction Cost June 1956	% Change in Month	% Change in Year	Building Cost June 1956	% Change in Month	% Change in Year
Atlanta	502	0	+6.2	424	0	+6.4
Baltimore	595	0	+3.4	491	0	+8.7
Birmingham	549	0	+7.6	447	0	+5.5
Boston	744	−0.1	+6.9	503	−0.2	+6.8
Chicago	788	+1.9	+6.3	500	+0.6	+5.0
Cincinnati	680	0	+2.4	475	0	+4.1
Cleveland	809	+2.1	+6.3	508	+2.2	+6.5
Dallas	509	−0.4	+4.3	424	−0.5	+4.5
Denver	670	0	+5.2	488	0	+3.0
Detroit	800	+2.6	+4.8	514	+1.4	+4.9
Kansas City	711	0	+3.6	498	0	+4.0
Los Angeles	733	−0.4	+9.1	491	+0.3	+7.5
Minneapolis	747	+0.7	+5.0	515	+1.1	+4.5
New Orleans	564	+2.7	+5.4	457	+0.8	+4.0
New York	819	0	+9.2	556	0	+4.2
Philadelphia	737	+2.1	+3.7	538	+0.4	+2.9
Pittsburgh	688	0	+2.8	500	0	+2.1
St. Louis	756	−0.4	+4.9	522	−0.6	+5.5
San Francisco	726	−0.1	+7.4	478	−0.2	+7.3
Seattle	720	0	+5.7	444	0	+6.1
U. S.—20 cities' avg.	692	+0.5	+5.5	489	+0.3	+5.1
Montreal	560	+0.3	+6.7	437	+0.4	+7.9
Toronto	575	0	+6.0	463	0	+3.1

For ENR cost indexes for preceding years see insert chart ENR Sept. 29, '55. Extra copies 50 cents.

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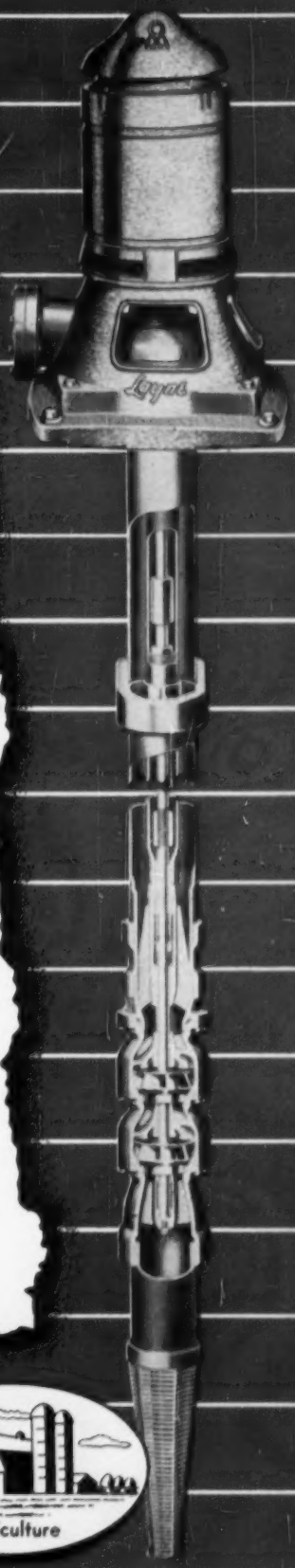

Layne

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THE LONGER LOOK:

Business holds steady in 1956 . . .

Put-in-place figures are lagging . . .

But, contract awards are going up

Housing starts have fallen off . . .

But, industrial building booms

Auto production is in a slump . . .

But, machinery production soars

Credit has been tightened up . . .

But, consumer income is rising

Stocks and inventories are high . . .

But, so are sales and backlogs

With half the year over, 1956 is shaping up as a "breather" for business generally. After a sharp upward spurt in 1955, the economy is holding steady, small dips in some sectors being offset by small gains in others. The outlook is for more of the same during the next few months, then a pick-up toward the end of the year.

Construction—with housing off and heavy construction booming—is a good example of what is happening in business generally this year. Here's what some of the indicators of construction activity show:

- **New construction put in place ran about 1% over the same 1955 months in the first five months of this year.**
- **But physical volume of work put in place (after allowing for price increases) is running about 4% below the same months of 1955. These put-in-place figures reflect bad spring weather and, possibly, statistics that have not kept pace with modern building practices.**
- **Dollar value of industrial, commercial, highway and sewer and water construction have been running 10% or more ahead of the early months of 1955.**
- **But new housing starts, which were booming along at an annual rate of nearly 1.4 million the first half of 1955, have been barely staying above a 1.1-million rate this year. This May there were only 107,000 private housing starts, compared with 135,100 in May 1955.**

While work actually put in place has remained near 1955 levels—with some types of work ahead and others behind—advance indicators point to a resurgence later in the year. ENR's contract awards, for instance, have been running 23% ahead of the same period last year. Industrial awards are up an eye-popping 137%.

In residential construction—the most important of the lagging sectors of construction—the clamp-down on mortgage terms and tight mortgage money are blamed for most of the dip. Economists specializing in construction expect, therefore, that easier credit and relaxation of terms could give housing a lift whenever government authorities feel it's necessary.

Business generally is showing the same tendency to mark time, and the statistical indicators show an assortment of both gains and losses. But, as with construction, there are signs of improvement later in the year.

- Gross national product—the total output of goods and services and the most comprehensive measure of business activity—has edged up only slightly this year. It jumped $30 billion from the fourth quarter 1954 to fourth quarter 1955. The gain has been only $1 billion to $2 billion in each of the first quarters this year.
- Industrial production, according to the Federal Reserve Board index, has slipped from a peak figure of 144 (1945-49 = 100) last December to rates of 141 and 142 during the spring months.

The weakest spot in industry so far this year is auto production, which is running about 30% behind the record rate of the first half of 1955. The auto industry turned out nearly 8,000,000 cars last year. Through hard selling, bargain deals and easy credit, it apparently "borrowed" from this year's potential market. Production schedules have been trimmed repeatedly so the industry could adjust to unwieldy retail inventories.

Steel and nonferrous metals, by and large, have been doing well. The drop in auto steel orders has been offset by rising shipments for construction, machinery, utilities, railroad equipment and aircraft.

Machinery industries generally are having a banner year, the only major exception being agricultural machinery. But new orders for construction machinery are running about 25% ahead of the first half of 1955 and 15% ahead of the second half. Electrical machinery manufacturers are booked solidly for the rest of 1956 and next year. And machine tools continue to add to their heavy backlogs.

Aside from the slump in auto sales, the two most important bearish shifts in the business situation from last year are in inventories and consumer credit.

Business inventories have climbed over $5 billion since the spring of 1955. Though much of this is represented in higher prices—which give higher dollar value to the same physical stocks—business is unlikely to be buying anywhere near as much for inventory-building over the next few months.

Consumer credit outstanding rose over $6 billion in 1955, enabling consumers to spend that much more than their current income. This is another boost the economy is not getting this year.

But there are elements of strength, too, that should give business a lift in the fall or winter.

Business is planning record capital spending on new plants and equipment. According to plans reported in the McGraw-Hill survey last month, business intends to put $39 billion into new facilities this year, 30% over 1955's record total.

Consumer income continues to rise at an average rate of over $1 billion a month, and a new round of wage increases following the steel settlement makes it sure to move even higher. So even without easier credit or a tax cut—either of which could come if business shows any tendency to slip—consumers have plenty of resources to kick off another spending spree.

(*B&F continued on page 112*)

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Wage offers rejected by union . . .

Strike Menaces Steel Supply

Threat of a steel strike, with crippling effects on an already-short construction industry, is more serious now than it has been at any time since the steelworkers' top brass opened negotiations with the big three steel producers May 28.

David J. McDonald, steelworkers president, this week rejected the offer of the steel producers for a five-year contract that would include six-cent an hour pay increases each year for five years, cost-of-living allowances, and a supplementary unemployment benefits plan.

McDonald called the wage offer "too little" and the contract "too long". He also claimed that the supplementary unemployment benefits plan was inferior to one negotiated last year with can producers.

• **Bargain individually**—After tossing the steel producers' offer out the window, McDonald (1) ended collective negotiation with the big three and announced the steelworkers would return to separate bargaining with each of the eleven major producers, (2) sent the 170-man steelworkers Wage Policy Committee home. Since this committee must ratify any new agreement, it is obvious that McDonald does not expect a quick settlement now.

By dealing individually with the eleven producers, McDonald is hoping to use the "divide and conquer" theory to bolster the union's pay scale. But some observers feel the move may not work—at least not immediately.

One of the top negotiators for the steel producers, John A. Stephens, vice president of U. S. Steel, said the firms would not settle for less than a five-year pact and would not raise the total cost of the package above their present offer, which they estimate is about 17¾ cents an hour for the first year and a total of 65 cents an hour over the full five years.

• **Room for compromise**—While prospects of getting a wage settlement without a strike seem slim, there is some elbow room for maneuvering at the bargaining table. The producers called for a five-year contract. McDonald doesn't want a pact that runs over two years. A compromise could come on a three-year agreement—with a reopener, which the steel companies have so far ruled out.

And, by juggling the components of its wage package, the steel companies may be able to get an agreement without going much higher than their first offer. Some of the fringe benefits offered could be dropped or scaled down, for example, and the amount put into direct pay instead. That would give McDonald a more dramatic figure to dangle in front of the steelworkers—and make a new contract likely.

• **No—or maybe?**—But the biggest question mark of all is how badly the steel companies want to avoid a strike. The high level of operations for months has resulted in fewer shutdowns than normal for maintenance. That maintenance can be deferred only so long.

And, the contract expires at a time when the steel companies could "take" a strike without any fatal effects. The slump in automobile manufacturing and some letdown in the appliance fields are giving the steel companies a breather for certain types of steel.

• **Would hurt construction**—Unfortunately, construction isn't in a position to keep going—even for a short time—in case of a strike. Although structural steel shipments are running well above last year, demand is mounting faster than shipments and the shortage is as bad as it has been at any time in the past year. And, activity will be at a peak at the very time the steel strike would occur—July 1.

Construction will take it on the chin with or without a strike. It's clear now from the steelmakers' offer that the wage settlement this year will be a generous one—and the price increase that will follow will be substantial. Earlier estimates that structural steel prices might go up as much as $12 a ton now seem to be on the conservative side.

Materials Prices Soften

Scattered price softening showed up in May among construction materials in primary markets.

The Bureau of Labor Statistics index of all building materials slipped fractionally from April. But the index is still 5.5% higher than a year ago.

Biggest price drop was reported for softwood plywood, which declined 4.5% in May, bringing the index almost 4% under a year ago. Plywood prices now are at a two-year low, reflecting the lag in homebuilding.

Prices also dropped in May for steel window sash, fir, and pine lumber, insulation materials, heating equipment and paint materials.

However, most building materials prices range from 3% to 9% higher than they did in the same period last year.

Aid to Airports

CAA allocates $52 million in federal matching funds

The federal-aid to airports program approved by Congress last year (ENR Aug. 18, '55, p. 21) paid its second dividend last week, when the Civil Aeronautics Administration announced allocation of $52 million in matching funds for the fiscal year beginning July 1.

The federal matching funds allocated last week will generate more than $102 million in airport construction, involving some 368 projects. Another $11 million in federal aid will be distributed when states complete their lists of eligible projects.

Eight airports will receive $1.25 million each from the latest allocation. These include airports at Atlanta, Chicago (O'Hare Field), Los Angeles, Miami, Minneapolis-St. Paul, New Orleans, New York (Idlewild), and Oakland, Calif. Two others, Detroit's Wayne Airport and the Nashville Field get $1 million each.

Atlanta's funds will be used to acquire a clear zone for Runway 9R and to help pay for construction of an administration building.

The O'Hare Field project includes extension of a runway by 655 ft, lighting, "warm up pads," and some work on an administration building.

Los Angeles will construct a runway and taxiway, extend a major storm drain and provide for a clear zone at the north end of a runway.

Miami, Fla., will use its funds for construction of phase II of its administration building.

Paving of taxiways and an apron are slated at the Wold-Chamberlain Airport owned by the Minneapolis-St. Paul Metropolitan Airports Commission.

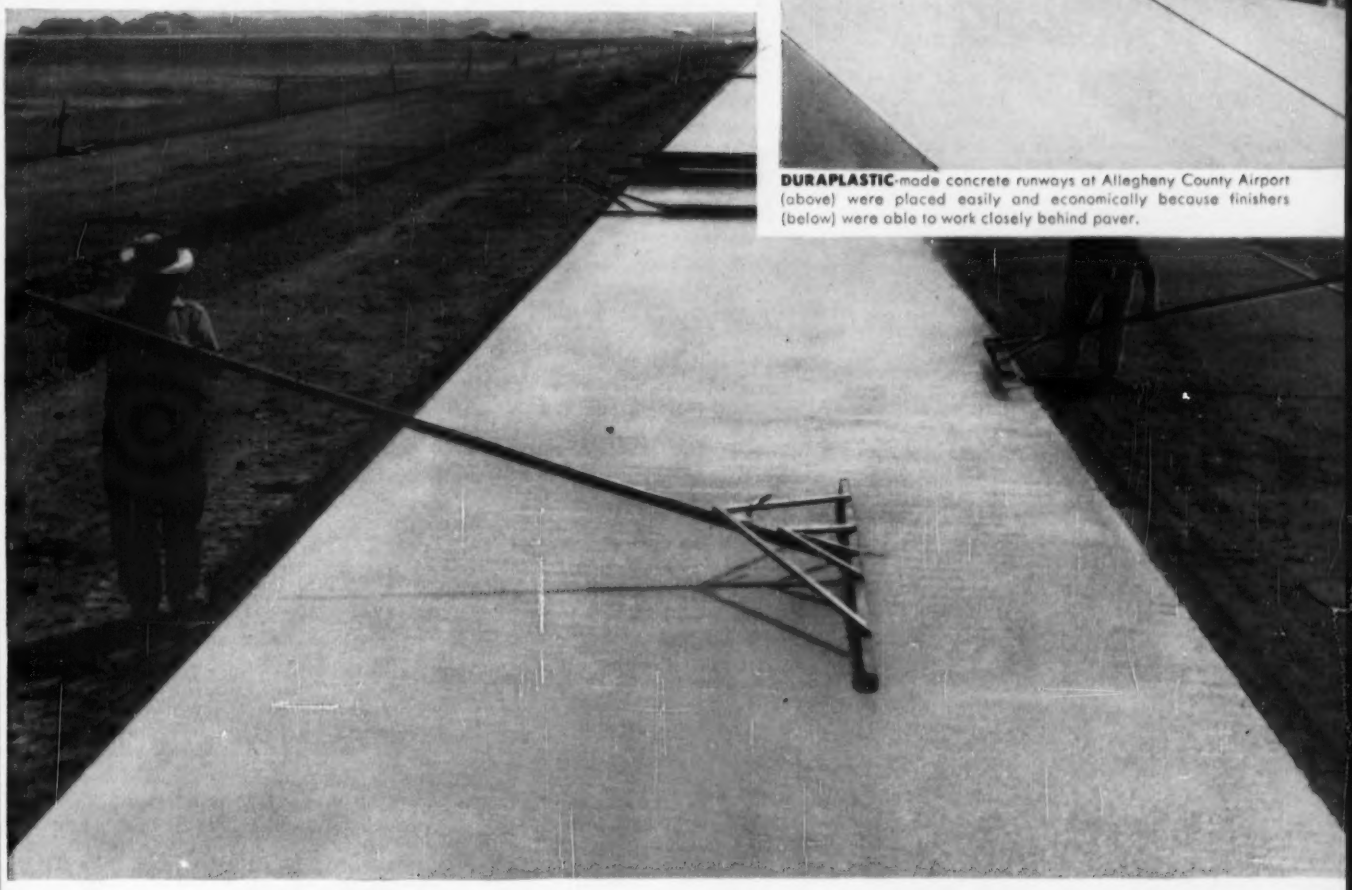
New Orleans will construct a control tower, fire station, north pier for a new terminal building and construct an administration building.

Idlewild Airport in New York City gets a $1.25 million allocation to be used for site preparation, a new runway and taxiways.

(*B&F continue on page 114*)

Why is this better concrete?

DURAPLASTIC-made concrete runways at Allegheny County Airport (above) were placed easily and economically because finishers (below) were able to work closely behind paver.



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"For a fast paving job on the lengthy Allegheny County Airport runways, we used Atlas Duraplastic cement for better workability and placeability," says Mr. Anthony A. Benintend, Vice President, Ben Construction Co., Pittsburgh, Pa.

Mr. Benintend and many other contractors have found out for themselves that Atlas Duraplastic air-entraining portland cement minimizes bleeding and segregation in concrete mixes, allowing finishers to work closely behind the paver. And, with Duraplastic, the finished concrete is fortified against the effects of freezing-thawing weather and scaling caused by de-icing salts, and provides greater durability.

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Cement Prices Up

Three firms boost prices at southern, midwestern mills

Three cement producers—Lehigh Portland, Lone Star and Penn-Dixie—are upping prices five to ten cents a barrel at their mills in the South and Midwest, effective July 1.

For the most part, the mills affected are those which did not join in the widespread price increase at other mills in January.

Lehigh Portland is increasing its price five cents a barrel at the Mitchell, Ind., mills and ten cents at its mills in Oglesby, Ill., Mason City, Iowa; and Iola, Kan.

Lone Star is boosting prices ten cents a barrel at its Greencastle, Ind., and Bonner Springs, Kan., Mills. Both of these mills raised their prices by a dime at the beginning of the year, but the increases were less than those posted at other Lone Star Mills.

Penn-Dixie's prices will go up ten cents a barrel at four mills: Kingsport, Tenn., Clinchfield, Ga., Richard City, Tenn., and West Des Moines, Iowa.

While these new price increases will hit certain areas, they do not indicate any general round of price boosts. At least four major producers who raised prices at the first of the year have said that they will hold current prices through the third quarter. These major producers include Alpha, Dragon, Hercules and Universal Atlas.

Cement producers have benefited from a firm price structure because demand has been heavy and shortages are expected to develop in many areas later in the construction season. One such shortage—in Minneapolis—has become serious. It was reported last week that four of the eleven concrete block manufacturing plants in the area have shut down, and other plants face a similar fate unless the cement shortage is relieved soon. The city's ready-mix concrete plants also have been affected. Although no shutdowns have been reported yet for the ready-mix plants, some have cut output.

Construction Put-in-Place Sets New Five-Month Record

Construction put-in-place set a new five-month high of $15.76 billion, bolstering the government's earlier prediction that such outlays will reach a record $44 billion as against $42 billion posted in 1955.

The continuing boom in commercial and industrial building has more than offset a 7% drop in private residential construction in the first five months, the Commerce and Labor Departments said in their joint reports.

Private industrial building put-in-place for the January through May period set a new record of $1.2 billion, well above the $926 million for the comparable months last year. May was the third consecutive time a new monthly record was set.

Housing slumped to $5.7 billion, down 7% from the same period in 1955.

Commercial buildings, public utilities and schools also set new records for the five-month period.

Over the Top

Proposed work backlog now over the $100-billion mark

A comparatively small job—a $1-million lumber distributing yard—this week pushed the ENR backlog of proposed work over the $100-billion mark for the first time in history.

The $1-million lumber distributing yard in Louisville, Ky., that started the backlog on its second $100 billion is for Weyerhaeuser Timber, Tacoma, Wash. It is being designed by the owner's engineering department, headed by J. S. Abel, chief engineer.

The project includes 40,000 sq ft of warehouse space, 10,000 sq ft for offices, loading docks, 11,000 sq ft of storage shed and railroad trackage.

While the Weyerhaeuser job is not considered particularly large, the project goes into the record books as the one that ushered in a new era for ENR's backlog of proposed work. This backlog represents a continuous inventory of new projects now in the planning and design stages. They flow out of the planning pipeline when a contract is awarded, and in today's market, they are the big promise of even more contracts next year.

The rate at which projects reach the planning stage and enter the backlog is a significant factor in the long-term trend of contract awards. It's more important than usual right now. The reason is that while contract awards are being made at the highest rate in history, the flood of new projects onto the design boards of architects and engineers is even larger.

Big construction projects are going under contract at the rate of $1.95 billion per month—but new proposed projects are pouring into the planning and design stage at the rate of $2.5 billion a month.

This surge of proposed work has built up a big inventory of projects for every type of heavy construction. Here's how the backlog shapes up for the various types of work: Waterworks, $2.1 billion; sewerage, $3.0 billion; highways, $11.7 billion; bridges, $3.0 billion; earthwork, irrigation and drainage, $11.3 billion; unclassified construction, $18.0 billion; public buildings, $17.7 billion; industrial buildings, $16.0 billion; commercial building, mass housing, $17.2 billion.

Business Briefs . . .

• **Miniature Annacis Island**—A $6-million industrial estate project similar in scope but smaller to the one under construction on Annacis Island in British Columbia, is now out of the planning stage and ready for development on Indian reserve land near Vancouver, B. C.

• **Hawaii home development authority**—A tight housing problem that will be componded by heavy construction plans may lead to creation by 1957 of a Hawaii home development authority, which would have the power to buy or condemn idle lands for homebuilding, with construction left to private contractors.

• **Alabama builds office building**—Construction of a $3-million seven-story state office building in Montgomery, Ala. is expected to get started this fall, with money from a bond issue provided by the 1955 legislature.

• **Bond vote gets re-count**—Final verdict on a $19.5-million bond issue for San Francisco's Hall of Justice will be made known this week. A preliminary count earlier this month indicated the project squeaked through.

• **Urban renewal**—Portland, Ore., is ready to start planning by July 1 on an 85 acre urban redevelopment project known as South Auditorium. The project is one of six designated last year by a Mayor's Committee on Redevelopment. HHFA has notified the City Planning Commission that $84,193 has been approved as a planning loan, and up to $3.2 million will be available as a federal grant.

• **Stock option raises needed capital**—A shortage of working capital to finance new construction business has been solved by the officers of the Foundation Company, one of the nation's oldest engineering and construction firms. Several officials exercised their option to purchase 2,500 shares of authorized but previously unissued stock.

PRESTRESSED CONCRETE PRODUCTION— A PROFITABLE, FAST-GROWING BUSINESS

The plant of Prestressed Concrete Inc., St. Paul. Building is 50′ x 235′, with additional 100′ of craneway and storage yard at rear. Construction is entirely of precast columns and wall panels, with 50′ clear span prestressed girders and channel slab roof construction.

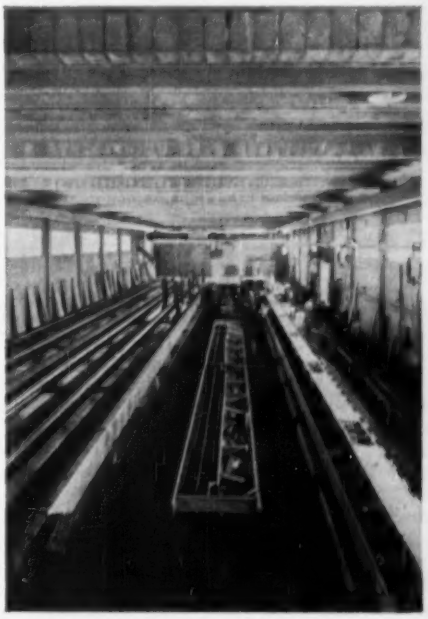
IN THE LAST THREE YEARS, pre-tensioned bonded prestressed concrete structural members have thoroughly demonstrated both their superior physical properties and their outstanding economy. Today they are universally accepted. All that prevents their use by many architects and engineers is the lack of nearby casting facilities.

Many casting beds are located outdoors where the investment can be held to a minimum. In mild climates an efficiently designed yard, operating all year, can produce about four times the amount of investment. Adverse climates reduce output in proportion to weather conditions.

However, Prestressed Concrete Inc., located in St. Paul, Minn. where temperatures range from a congealing 30° below zero to a sizzling 100° above, has its casting yard completely enclosed as pictured here.

The cost of this yard, including its overhead crane, but not including land and concrete mixing equipment, was about double that of an open yard. But housing of the necessary machinery and curing facilities permits continuous operation. Products to date include prestressed channel slabs, beams and girders as well as precast columns and wall panels. Yearly output sells for more than twice the amount of the original investment.

If you are interested in the possibility of establishing a casting yard, ask us for information and suggestions. Construction Materials Division, John A. Roebling's Sons Corporation, Trenton 2, N. J.



Four channel beds at left are 200′ long. In center is bed for precasting reinforced beams. Next to the right is a 100′ bed for prestressing beams. At far right is a form for precasting columns.

Roebling 7-wire strand, showing valleys between wires which produce mechanical bond.

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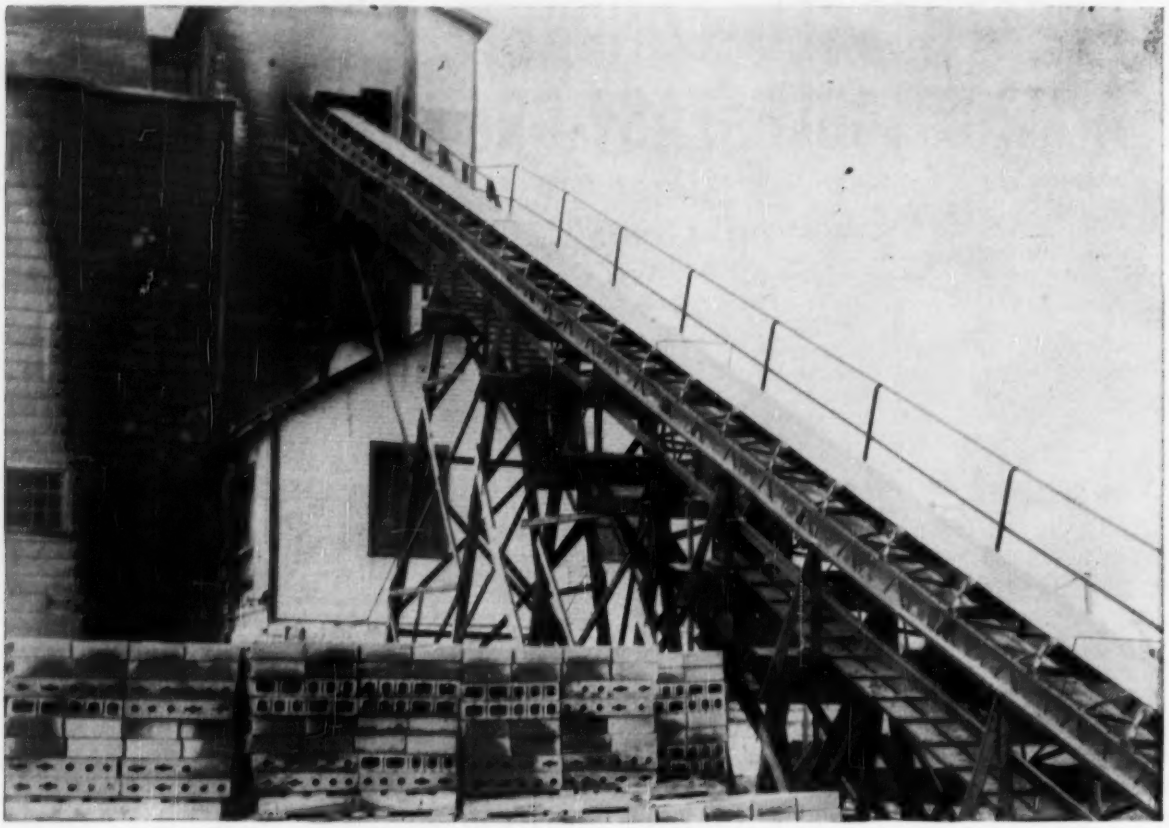

New Barber-Greene conveyor, erected in just 2 ½ days after the fire, boosts tonnage from 250 tons a *day* to 250 tons per *hour*.

Conveyor destroyed by fire on Monday
New one operating Friday

On Monday fire roared up a wooden conveyor owned and operated by a Milwaukee cement block company. Out of the devastation only the wooden "A" frames remained. Without the conveyor, production was at a standstill.

At 6:00 the following morning the owner called the local Barber-Greene distributor to see what could be done. Drawing from his own stock of standardized conveyor components—trusses, idlers, drives—the distributor was able to rush all the necessary components to the burned out plant by noon. And by Friday morning the new conveyor was erected and operating.

This fire and the quick return to normal operations point up the basic advantages of Barber-Greene *standardized* components. These advantages include: quick delivery from stocks of standardized components . . . elimination of engineering time required when building "custom-made" conveyors . . ; and fast, easy erection.

Trouble-free operation is an additional benefit of the factory aligned and adjusted drives and terminals. Flexibility in shortening or lengthening your conveyor is another plus.

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Louisiana Repeals Work Law

State action is first of its kind in recent years and sparks new interest in the debate on compulsory unionism

The first big victory for those who have fought against right-to-work laws occurred in Louisiana last week, when the State Senate voted 21 to 18 to repeal the Louisiana law adopted in 1954. Announcement of the vote was greeted by cheers and applause in the crowded Senate chamber.

Gov. Earl K. Long, who has repeatedly proclaimed his neutrality on the right-to-work issue, was expected to sign the measure without delay, making Louisiana the first Southern state to repeal the controversial law.

The Senate action came nine days after the House of Representatives had recorded a 57-44 vote for repeal. A referendum is not required.

Typical of similar laws still in force in 17 other states, the Louisiana statute provided that no person should be denied the right to work because of membership or non-membership in a labor union. Those against whom violations were directed were entitled to both injunctive relief and damages.

After final passage of the Louisiana repealer, Sen. Jackson Davis warned that "two years from now we will be back to re-enact right to work. The people of Louisiana have lost a battle, not a way."

Repeal of existing right-to-work laws and prevention of new ones has become one of the major legislative goals of organized labor. Among the laws' strongest opponents have been the AFL-CIO Building Trades, whose two-fold attack has embraced repeal of the Taft-Hartley Act's Section 14 (b) which authorizes enactment of the laws at the state level.

Coupled with the U.S. Supreme Court's recent decision on the application of the Nebraska law to employees subject to the Federal Railway Labor Act, the Louisiana decision marks another milestone in a basic ideological debate.

• **The issues**—The fundamental question raised by union shop agreements—which right-to-work laws make illegal—is whether workers "who enjoy the fruits and benefits of unions should make a fair contribution to the support of the unions." In the Nebraska case, the Supreme Court said: "We only hold that the requirement for financial support of the collective bargaining agency by all who receive the benefits of its work is within the powers of Congress under the commerce clause and does not violate either the First or Fifth Amendments."

Although the policy issue involved in compulsory unionism was not before the court, Justice Douglas remarked that "one would have to be blind to history to assert that trade unionism did not enhance and strengthen the right to work. . . . To require, rather than to induce, the beneficiaries of trade unionism to contribute to its costs may not be the wisest course. But Congress might well believe that it would help insure the right to work in and along the arteries of interstate commerce."

Thus the Supreme Court cut away most of the constitutional objections to compulsory unionism that does not go beyond requiring payment of periodic dues, iniation fees and assessments. These requirements, said the court, do not impair freedom of expression or force men "into ideological and political associations which violate their right to freedom of conscience, freedom of association and freedom of thought protected by the Bill of Rights."

• **Up to the people**—By declaring that it's within the police power of a state to prohibit the union or the closed shop and, at the same time, stating that use of the union shop as a stabilizing force "seems to us to be an allowable one," the Supreme Court has left the ultimate decision to the people.

The Louisiana action has already generated warnings of recall action against some of the legislators who voted for repeal. Elsewhere, repealer movements have been in process or are expected in Arizona, Arkansas, Florida, Iowa, Mississippi, Nebraska, Nevada, North Dakota, Tennessee and Texas. Meanwhile, 15 other states have been named as "likely" candidates for new right-to-work laws.

A graphic illustration of the issue's current appeal is the impressive list of those who intervened in the Supreme Court's Nebraska case: the Attorney Generals of Nebraska, Florida, Mississippi, South Carolina, South Dakota, Texas, Utah, Virginia; National Association of Manufacturers; U.S. Chamber of Commerce; American Farm Bureau Federation; Southern States Industrial Council; the AFL-CIO; and the National Right-to-Work Committee.

Union Peace Plan for Industrial Work

This week, the jurisdictional conflict between the AFL-CIO craft and industrial unions appeared headed for settlement. A new approach for solving the age-old dispute between the two union groups has been worked out by AFL-CIO President George Meany. At the same time, Meany has persuaded the building trades to call off their slowdown of union mergers on the state level.

The action stemmed from a meeting last week between Meany and 19 craft union presidents, headed by Building Trades President Richard J. Gray.

How settlement plan shapes up:

• Meany has named a six-man committee, all members of the Executive Council, to draw up a formula for dividing construction work in the nation's factories between craft and industrial unions. The members are: Walter Reuther (United Auto Workers), S. Buckmaster (rubber workers), and David J. McDonald (steelworkers); Harry C. Bates (bricklayers), Maurice Hutcheson (carpenters), and Joseph Keenan (electrical workers).

• When the formula is drawn up, any disputes that continue to arise between craft and industrial unions will go to the committee already set up by the Building Trades and Industrial Union Departments (ENR April 5, p. 158). This group will referee any conflicts by interpreting the new policy.

While there was no indication how long it would take to find a settlement of a conflict that has lasted for years, Gray commented: "We believe it will be the means of settling this controversy to the satisfaction of all concerned."

Gray's remarks were contained in a letter sent this week to all state and local building trades organizations, directing them to "discontinue your efforts" against state mergers. Gray specifically noted that he was recalling his April 27 letter opposing such mergers (ENR May 3, p. 112).

(*Labor continued on page 119*)

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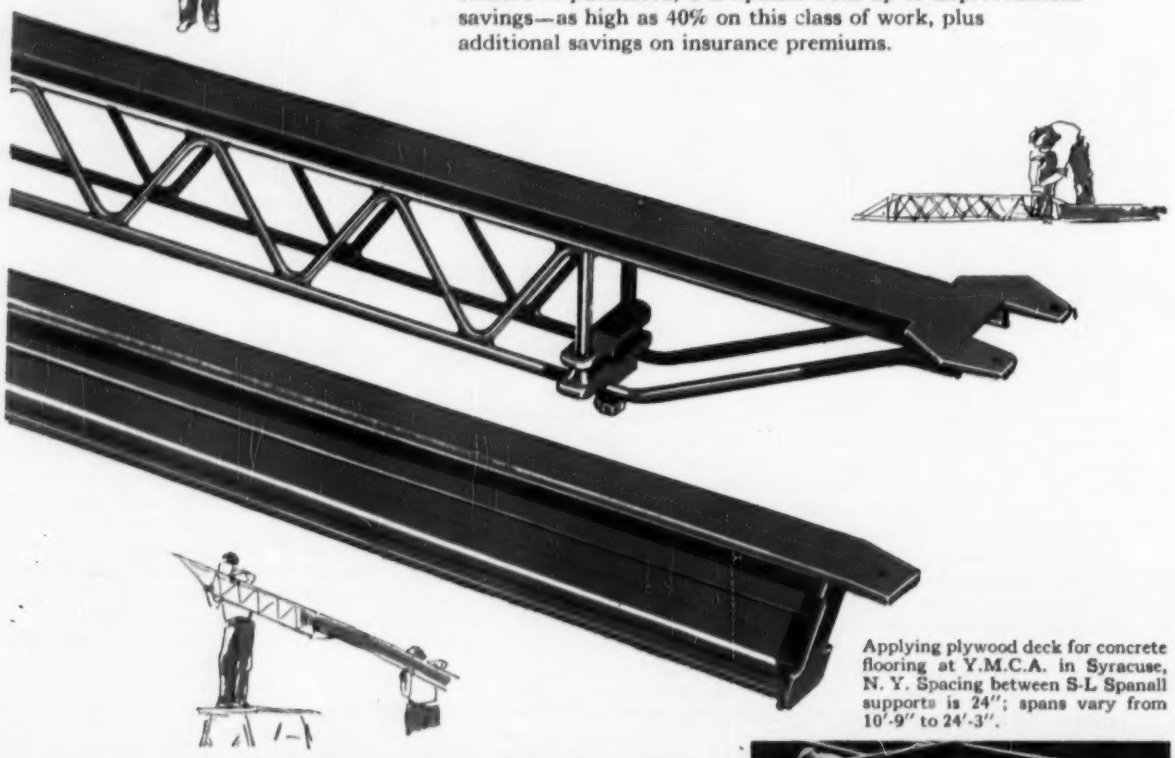

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Paid Vacations Catching On

Collective bargaining is steadily liberalizing paid vacation practices—a trend which the unions, including some in the construction industry, will apparently continue to push, according to the AFL-CIO.

In the last issue of its "Collective Bargaining Report," the new federation predicts the general pattern in many industries will soon become "minimum vacations of two weeks for all but brand-new employees, three-week vacations for employees with several—most likely 5 to 10—years of service, and four weeks for employees with longer service records."

• **Construction**—Although the construction industry has traditionally bypassed this area of fringe benefits, largely because of its seasonal fluctuations and the casual nature of its employment, vacation benefits, though spotty, are nothing new. The report notes that California is one of the areas of "notable" achievements, and ENR records show that vacation interest is fairly widespread.

Existing contracts in New York City, for example, call for employer vacation-fund contributions at the rate of 3% for asbestos workers, 4% for electrical workers, 10 cents for marble workers, and 2% for sheet metal workers and steam fitters.

Excavating and building material drivers in Cleveland, Ohio, this year won a three-week vacation period for those with 10 or more years of service; 14,500 carpenters in seven counties around Detroit, Mich., negotiated a 2% vacation fund increase, making it now 6%; one contractor association and a number of independents have signed contracts giving tile layers in 16 northern California counties 9 cents an hour for vacation purposes; and teamsters employed by the St. Louis Quarrymen's Association have just worked out a new vacation plan: A one-week vacation after one year, two weeks after three years, and three weeks after ten years.

• **Justification**—The AFL-CIO says the growing interest in vacation clauses doesn't stem from greater union strength alone.

Suggesting a currently wider recognition of the "social and economic desirability" of vacations, it claims these breather periods "contribute to employee physical and mental well-being, to improved working morale, increased productivity, reduced absenteeism."

From a union point of view, it suggests that the growing interest in vacations reflects labor's efforts "to translate some of the benefits of the nation's rising productivity into increased vacation leisure."

• **Trends**—Although perhaps the most significant of recent trends has been toward two weeks as the minimum vacation period—with interest in three and four weeks gaining momentum—the AFL-CIO points out three other trends of general interest.

Some effort is being made, it notes, to give new employees a break, either by shortening the qualification period to six months or by granting one vacation day for each one or two months of service. Another trend is to relate vacation pay to average earnings—making vacation paychecks approximately equal to an employee's normal weekly pay where overtime, premium shift, etc., are a significant factor.

Along with these has been a tendency to treat paid vacations as an "earned right" that can't be lost by separation from employment. Under contract clauses adopted to achieve this, the AFL-CIO notes, accrued and unused vacation credits become a factor in computing severance pay.

• **States step in**—Earlier this month, two East Coast states used their unemployment compensation laws to step into the vacation picture.

Governor Meyner of New Jersey signed into law a new provision making state workers on involuntary vacations without pay eligible for jobless benefits ranging up to $35 a week. The law is designed to help the worker who doesn't have enough seniority to receive vacation benefits from his employer, but who still loses a week or more of work through a plant-wide vacation shutdown.

And in New York, State Industrial Commissioner Isador Lubin has ruled that workers thrown out of work by vacation shutdowns may get both vacation allowances and state benefits under certain conditions. They can get the state benefits if their union contract provides for vacation allowances but is silent as to vacation periods; they can't get them if the union has consented to a shutdown. The issue is similar to the dual-pay problem raised by GAW plans—vacation allowances received during an agreed-to shutdown are "wages," but become non-wage income or a "bonus for past services" when not part of a negotiated shutdown plan.

OFFICIAL PROPOSALS

Bids: July 12, 1956

The Richmond-Petersburg Turnpike Authority Richmond, Va.

June 12, 1956

NOTICE IS HEREBY GIVEN that Sealed Bids will be received by The Richmond-Petersburg Turnpike Authority for:

CONTRACT NO. D-1-G, SECTION D

Construction of the Richmond-Petersburg Turnpike, Contract D-1-G, Section D, Grading, Drainage, Paving and Structures; from the Appomattox River to a point 3600 feet north of State Highway 624, in the City of Colonial Heights.

The approximate length of the Project is 2.5 miles.

Bids for the above described work will be received at the office of The Richmond-Petersburg Turnpike Authority, 1015 East Main Street or by mail at P. O. Box 1-R, Richmond 2, Va., until 10:00 A.M. (EST) 11:00 A.M. (DST), July 12, 1956 and will be publicly opened and read aloud immediately thereafter in the Hunt Room of the Hotel Raleigh, 9th and Bank Streets, Richmond, Va.

Bids will be received only from those bidders who are registered in the State of Virginia and who are prequalified with The Richmond-Petersburg Turnpike Authority.

Plans, Specifications, Proposal, and form of Proposal Bond, Contract and Contract Bond are on file at the offices of The Richmond-Petersburg Turnpike Authority, 1015 East Main Street, Richmond, Va. and at the offices of the Engineers, Parsons, Brinckerhoff, Hall & Macdonald, 51 Broadway, New York, New York, where they may be inspected by prospective bidders during office hours.

Plans, and Specifications (including Proposal Form, Proposal Bond Form, Contract and Contract Bond Form, Special Provisions and Turnpike Supplemental Specifications) will be furnished to registered prequalified contractors for $50.00 per set. Va. Dept. of Highways, Road and Bridge Specifications may be purchased for $1.00 per copy each. Cross Sections, if desired, may be purchased for an additional $60.00 per set. No refund will be made for any of the above stated charges.

Proposal Guaranties consisting of either a certified or cashier's check in the amount of not less than 2½% of the total amount bid made payable to The Richmond-Petersburg Turnpike Authority together with a satisfactory Proposal Bond in an amount of not less than 20% of the total amount bid, specifying The Richmond-Petersburg Turnpike Authority as the Obligee must accompany each bid. All proposal guaranties will be returned immediately after the opening of bids except those of the three lowest bidders.

All work shall be done in accordance with the Plans and the Virginia Dept. of Highways, Road and Bridge Specifications dated April 1, 1954 as amended by The Turnpike Supplemental Specifications dated March 1956; both as amended by the Special Provisions.

The Authority reserves the right to reject any or all bids, submitted in response to this advertisement, and to waive technicalities as it may deem best for the interest of the Authority.

NOTE: Plans and Specifications will not be mailed prior to the receipt of payment of cost shown in this Advertisement.

The Richmond-Petersburg Turnpike Authority
S. H. Meem, Jr.
(Assistant General Manager)

U. S. Government

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-4716) will be received at Winter, California, until July 31, 1956 for furnishing labor and materials for Putah Diversion Dam and Putah South Canal, Station 12/46.44 to Station 14/16, Solano Project, California. Location near Winters, California. Principal items are 72,000 cu. yds. excavation; 6,000 cu. yds. concrete in structures and canal; furnish and install 14 radial gates and hoists; and other work. Completion time 360 days. For particulars, address Bureau of Reclamation, P. O. Box 546, Winters, California, or Building 53, Denver Federal Center, Denver 2, Colorado. W. A. Dexheimer, Commissioner.

OFFICIAL PROPOSALS

RATE: The rate for Official Proposal advertising is $2.10 per line or fraction set solid. Where the advertisement is set other than solid, the space is measured by total space occupied and charged on basis of 12 lines to the inch.

CLOSING DATE: Friday 10:30 A.M. for issue dated the following Thursday.

SEND COPY TO: Official Proposal Division, Engineering News-Record, 330 West 42nd Street, New York 36, N. Y.

Bids: June 28, 1956

New York State Road Work

NOTICE TO CONTRACTORS: STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of the Highway Law, and Article 2, Title 9 of the Public Authorities Law, sealed proposals will be received until ten-thirty o'clock A.M., advanced standard time, which is nine-thirty o'clock A.M., eastern standard time, on the 28th day of June 1956, by Henry A. Cohen, Director, Bureau of Contracts and Accounts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for the following project: ALBANY & RENSSELAER COUNTIES, G. L. Nickerson, Dist. Engr., 353 Broadway, Albany 1, N. Y.

Contract No.	Type	Name of Highway and Miles	Deposit for Plans	Bid Deposit	Department Estimate
TAB8. 56-70	Superstructure: East and West Approach Spans (Stringer Type) and Main Spans (3 Span Continuous Truss) Incl. Railing	N. Y. S. Thruway Berkshire Section (Hudson River Bridge) 1.047 Miles	$15	$500,000	$8,950,000

Maps, plans, specifications and proposal forms may be seen and obtained at the office of the State Department of Public Works, Bureau of Contracts and Accounts, Albany, N. Y., and at the office of the District Engineers noted above and may also be seen at the office of the State Department of Public Works, 270 Broadway, New York City.

The deposit for Plans and Proposal Forms for each contract is indicated above. A refund will be made in full to bidders for return of one set, in good condition, within 30 days of award, or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

Special attention of bidders is called to "General Information for Bidders" in the proposal, specification, and contract agreement. Award of a contract is subject to priorities and allocations under the Defense Production Act of 1950, as amended, and all regulations issued thereunder.

Proposal for each contract must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum as specified in the advertisement and the proposal. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Laws, as set forth in "Instructions to Bidders".

The right is reserved to reject any or all bids.

JOHN W. JOHNSON,
SUPT. OF PUBLIC WORKS

Bids: July 3, 1956

Pennsylvania Turnpike Commission Harrisburg, Pennsylvania

NOTICE TO BIDDERS

Sealed proposals will be received by the Pennsylvania Turnpike Commission through the Chairman, 11 North Fourth Street, Harrisburg, Pennsylvania, until 10:00 a.m., Eastern Daylight Saving Time, the 3rd day of July 1956, and immediately thereafter will be taken to the Public Utility Commission's Hearing Room #1, North Office Building, State Capitol, Harrisburg, Pennsylvania, and publicly opened and read aloud for the following contracts:

Contract No. 183. From milepost 67.49, Station 466+29 (the eastern approach to the Irwin Interchange) to milepost 82.50, Station 1109+10.8, a total distance of 15.01 miles.

Contract No. 184. From milepost 140.24, Station 551+69 to milepost 152.00, Station 551+69, a total distance of 11.76 miles.

Contract No. 185. From milepost 152.00, Station 551+69 to milepost 164.78, Station 1929+42 (the west portal of Rays Hill Tunnel), a total distance of 12.78 miles.

The project consists of the resurfacing of the pavement with a bituminous mixture conforming to the specifications and to the thickness and widths shown on the plans or as directed by the Engineer.

Copies of plans, specifications and Contract Documents are on file and open to public inspection on 19 June 1956, at the office of the Pennsylvania Turnpike Commission in Harrisburg, Pennsylvania, and at the Everett Maintenance Building, Everett, Pennsylvania. Plans, specifications and other contract documents will not be available before this date for mailing to prospective bidders.

Plans and contract documents may be obtained from the Commission upon payment of five ($5.00) dollars for each set. Copies of the Specifications for grading, drainage, paving and structures may be purchased from the Pennsylvania Turnpike Commission for the sum of five ($5.00) per copy. No refund will be made for plans or contract documents returned unless the project is withdrawn from letting by the Pennsylvania Turnpike Commission.

Remittances are payable by check or P. O. money order to the Pennsylvania Turnpike Commission and must accompany requests for drawings, specifications and contract documents.

The character and amount of bid security to be furnished by bidder is stated in the Instructions to Bidders.

No bids may be withdrawn for thirty (30) days after the scheduled closing time for receipt of bids.

The Pennsylvania Turnpike Commission reserves the right to waive any informalities in or to reject any or all bids.

PENNSYLVANIA TURNPIKE COMMISSION
John F. Byrne
Secretary and Treasurer

Harrisburg, Pennsylvania
13 June 1956

Bids: July 5, 1956

New York State Roadwork

NOTICE TO CONTRACTORS

STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of Highway Law, sealed proposals will be received until 10:30 A. M., Eastern Daylight Saving Time, on July 5, 1956, by Henry A. Cohen, Director, Bureau of Contracts and Accounts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y. for:

SOIL EXPLORATIONS AND FOUNDATION INVESTIGATIONS AT VARIOUS SITES ON ROUTE 17 EXPRESSWAY, DAMASCUS TO WEST WINDSOR, TOWNSHIP OF WINDSOR, BROOME COUNTY, WHICH CONSTITUTES CONTRACT NO. SPEC. SM-89

Maps, plans and specifications may be examined and obtained at the following offices:

(a) Bureau of Contracts and Accounts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany 1, New York.

(b) Mr. Joseph C. Federick, District Engineer, 71 Frederick Street, Binghamton, New York.

(c) Mr. William M. Trainer, Associate Contract Engineer, Department of Public Works, 270 Broadway, New York City.

The deposit for a set of plans, specifications and proposal forms is $5.00. A refund in full will be made to bidders for return of one set in good condition within 30 days of award or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

The Engineer's estimate of cost for this work is $36,300.00.

Proposal for this contract must be submitted in separate sealed envelope with the name of the contract plainly endorsed on the outside of the envelope. Proposal must be accompanied by draft or certified check, payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum of $1,820.00. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Law, as set forth in "Instruction to Bidders."

The right is reserved to reject any or all bids.

J. W. JOHNSON
SUPERINTENDENT OF PUBLIC WORKS

Bids: July 3, 1956

Contract O & M - 379

ADVERTISEMENT
THE PORT OF NEW YORK AUTHORITY
NEWARK AIRPORT
PAVING AND SEALCOATING

Sealed proposals for furnishing all labor, material and equipment for paving and sealcoating taxiway, runways and roadways at Newark Airport will be received at the office of the Department of Purchase and Administrative Services of The Port of New York Authority, Room 900, 111 Eighth Avenue, New York 11, until 11 A.M., Tuesday, July 3, 1956, at which time and place said proposals will be opened and read.

Contract documents may be seen at the office of the Department of Purchase and Administrative Services, Room 900, and copies will be furnished upon deposit of $10.00 per set. Deposit must be delivered to Treasury Department, Room 1001, where a receipt in duplicate will be issue. The duplicate copy of the receipt is then to be delivered to the Department of Purchase and Administrative Services, and you will be furnished with the contract documents. The deposit will be remitted if the documents are returned in good condition, not later than thirty days after the opening of proposals. The deposit will be forfeited if the documents are not returned within thirty days.

THE PORT OF NEW YORK AUTHORITY
Donald V. Lowe, Chairman

New York, June 21, 1956

OFFICIAL PROPOSALS

Bids: June 28, 1956

New York State Road Work

NOTICE TO CONTRACTORS: STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of the Highway Law, Article 2, Title 9 of the Public Authorities Law, and special provisions for projects financed with Federal Aid Funds, sealed proposals will be received until ten-thirty o'clock A.M., advanced standard time, which is nine-thirty o'clock A.M., eastern standard time, on the 28th day of June 1956, by Henry A. Cohen, Director, Bureau of Contracts and Accounts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for the following projects:

County	Contract No.	Name	Miles	Type	Deposit	Estimated Cost of Work
DISTRICT No. 1; G. L. Nickerson, District Engineer, 353 Broadway; Albany, N. Y.						
Rensselaer (Route 153)	FASS 56-5	West San Lake-Poestenkill-Cropseyville; Pt. 2 Proj. No. S486(1)	2.16	Bit. Mac. Pen. Meth.; Ty. 1=2.04 Mi.; Asp. Conc. Opt.=0.02 Mi.; Misc. Work=0.10 Mi.	$15,000 Plans $10	$267,000
Saratoga (Route 197)	FARC 56-42	Reynolds Corners-Fort Edward, S.H. 1748 Proj. No. S401(1)	0.76	Asp. Conc. Opt.	$9,000 Plans $10	167,000
DISTRICT No. 3; Wm. Robinson, District Engineer, 301 E. Water St.; Syracuse, N. Y.						
Onondaga (Route 57)	FAC 56-1	City of Syracuse: Oswego Boulevard Proj. No. IN463(10)	1.44	Demolition	$2,800 Plans $10	50,000
Onondaga (Route 298)	FARC 56-47 FASH 56-3	Syracuse-Bridgeport, Pt. 1, S.H. 672; Syracuse-Bridgeport, S.H. 672A; Syracuse-Bridgeport, Pt. 3 (Seq. No. 298-1-5). Proj. No. U-UG994(5)	2.70 (2.11 Acc.)	9" Cem. Conc. Pavt.; 2 at 37' Var. Wide=3.50 Mi.; Asp. Conc. Ty. 2A=1.22 Mi.; R.C. Box Culv. Br. 25'; R.R. Sep. I-Beam 103.7'	$130,000 Plans $25	2,350,000
Onondaga and Oswego (Route 11)	FARC 56-40 RC 56-41	Cicero-Brewerton, S.H. 5249; Central Square-Union Square, S.H. 5415; Union Square-Pulaski, Pt. 1 and Pt. 2, S.H. 5083-5221; Pulaski-Sandy Creek, S.H. 5275 Proj. No. F463(11)	26.05	Asp. Conc. Ty. 1A	$45,000 Plans $10	806,000
Seneca (Routes 5 and 20)	FARC 56-38 RC 56-39	Geneva-Waterloo, S.H. 5087; Geneva-Waterloo, Pts. 2 and 3, S.H. 8240. Proj. No. F406(4)	1.58	Asp. Conc. Ty. 1A	$6,000 Plans $10	111,000
Tompkins (Route 34)	FARC 56-46	Esty Glen-South Lansing, S.H. 5256 Proj. No. F447(5)	3.08	Asp. Conc. Ty. 1A	$6,000 Plans $10	119,000
Tompkins (Route 13)	FARC 56-37	Groton Village; Freeville Village; Dryden Village; S.H. 1002. Proj. No. F513(5)	1.33	Asp. Conc. Ty. 1A	$4,300 Plans $10	77,000
DISTRICT No. 5, E. G. H. Youngmann, District Engineer, 65 Court Street, Buffalo, N. Y.						
Erie (Routes 18 and 62)	FARC 56-45	Niagara Falls-Buffalo, Pt. 5 and Pt. 4, S.H. 5193-5172 Proj. No. F500(6)	4.56	Asp. Conc.; Opt.	$24,000 Plans $10	436,000
DISTRICT No. 8; Kurt G. Rauer, Acting District Engineer, Pleasant Valley Road, Poughkeepsie, N. Y.						
Orange (Route 17K)	R.C. 56-43	Montgomery Village: Ward, Bridge, and Union Sts. S.H. 1675	....	Demolition	$150 Plans $10	2,500
Westchester Thruway)	FANETC 56-4 FASTC 56-7	New York State Thruway, New England Section; Sub. NE 4 (North St. to Boston Post Road) and 5 Access or Cross Roads. Proj. No. IN-1068(12)	1.43 (0.08 Acc.)	9" Cem. Conc. Pavt. 2 @ 37' Var. Wide=1.39 Mi.; Asp. Conc., Opt.=0.14 Mi.; Asp. Conc., Opt. (Access Roads)=0.08 Mi.; 3 Hy. Sep. Comp. I-Beams 111.8' 54.5', and 409.1'; 1 Conc. Arch Br. 25.5'	$150,000 Plans $100	2,650,000
DISTRICT No. 10; M. E. Goul, District Engineer, 325 West Main Street, Babylon, L. I., N. Y.						
Queens (Route 25D)	FA HHE 56-1	Horace Harding Expressway; Section 1; Contract 4 Proj. No. U-862(8)	1.00 (2.56 Acc.)	9" Cem. Conc. Pavt. with Carbon Black 72' Var. Wide=1.06 Mi.; 9" Cem. Conc. Pavt. (Acc. Rds.)=0.12 Mi.; Asp. Conc.; Opt. (Acc. Rds.)=2.44 Mi.; Misc. Work=0.03 Mi.; 2 Hy. Sep. Comp. I-Beams 121.7' and 116.3'; 1 Ped. Overpass I-Beam 129'	$280,000 Plans $100	5,068,000

Maps, plans, specifications and proposal forms may be seen and obtained at the office of the State Department of Public Works, Bureau of Contracts and Accounts, Albany, N. Y., and at the office of the District Engineers noted above, and may also be seen at the office of the State Department of Public Works, 270 Broadway, New York City.

The deposit for Plans and Proposal Forms for each contract is indicated above. A refund will be made in full to bidders for return of one set, in good condition, within 30 days of award, or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

Special attention of bidders is called to "General Information for Bidders" in the proposal, specification, and contract agreement, and to the special provisions applying to projects financed with federal funds. Award of a contract is subject to priorities and allocations under the Defense Production Act of 1950, as amended, and all regulations issued thereunder.

Proposal for each contract must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum as specified in the advertisement and the proposal. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Laws, as set forth in "Instructions to Bidders".

The right is reserved to reject any or all bids.

JOHN W. JOHNSON
SUPT. OF PUBLIC WORKS

Bids: July 17, 1956

Contract NYA-780.002

ADVERTISEMENT
THE PORT OF NEW YORK AUTHORITY
NEW YORK INTERNATIONAL AIRPORT
HANGAR NO. 12
PAVING AND UTILITIES

Sealed proposals for the construction of paving and the furnishing and installation of utilities for Hangar No. 12 at New York International Airport will be received at the office of the Chief Engineer of The Port of New York Authority, Room 1100, 111 Eighth Avenue, New York 11, N. Y., until 2:30 P. M. on Tuesday, July 17, 1956, at which time said proposals will be opened and read in Room 1108.

Contract documents may be seen at the office of the Engineer of Design of the Authority, Room 1112. Documents will be furnished upon deposit of $30.00 per set for not more than three sets to any one company (each set including one copy of the contract drawings). Additional sets will be furnished upon payment of $30.00 per set, which payment is not returnable. Deposits and payments shall be delivered to the Treasury Department, Room 1001, where a receipt in duplicate will be issued. A copy of the receipt shall be delivered to Room 1112, where the documents will be furnished.

Those who have submitted a bid on the contract will receive a refund of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals. Those who have not submitted a bid will receive a refund of one-half of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals.

THE PORT OF NEW YORK AUTHORITY
Donald V. Lowe, Chairman

New York, June 21, 1956

Bids: July 3, 1956

Contract O & M - 383

ADVERTISEMENT
THE PORT OF NEW YORK AUTHORITY
NEW YORK INTERNATIONAL AIRPORT
SEAL COAT TREATMENT

Sealed proposals for furnishing all labor, material and equipment for furnishing and applying seal coating on weathered and worn pavement at New York International Airport will be received at the office of the Department of Purchase and Administrative Services of The Port of New York Authority, Room 900, 111 Eighth Avenue, New York 11, until 11 A.M., Tuesday, July 3, 1956, at which time and place said proposals will be opened and read.

Contract documents may be seen at the office of the Department of Purchase and Administrative Services, Room 900, and copies will be furnished upon deposit of $10.00 per set. Deposit must be delivered to Treasury Department, Room 1001, where a receipt in duplicate will be issued. The duplicate copy of the receipt is then to be delivered to the Department of Purchase and Administrative Services, and you will be furnished with the contract documents. The deposit will be remitted if the documents are returned in good condition, not later than thirty days after the opening of proposals. The deposit will be forfeited if the documents are not returned within thirty days.

THE PORT OF NEW YORK AUTHORITY
Donald V. Lowe, Chairman

New York, June 21, 1956

Bids: July 3, 1956

Contract O & M - 386

ADVERTISEMENT
THE PORT OF NEW YORK AUTHORITY
TETERBORO AIRPORT
ACCESS ROADS AND DRAINAGE
IMPROVEMENTS

Sealed proposals for furnishing all labor, material and equipment for constructing two access roads and making runway drainage improvements at Teterboro Airport, Teterboro, New Jersey, will be received at the office of the Department of Purchase and Administrative Services of The Port of New York Authority, Room 900, 111 Eighth Avenue, New York 11, until 11 A.M., Tuesday, July 3, 1956, at which time and place said proposals will be opened and read.

Contract documents may be seen at the office of the Department of Purchase and Administrative Services, Room 900, and copies will be furnished upon deposit of $10.00 per set. Deposit must be delivered to Treasury Department, Room 1001, where a receipt in duplicate will be issued. The duplicate copy of the receipt is then to be delivered to the Department of Purchase and Administrative Services, and you will be furnished with the contract documents. The deposit will be remitted if the documents are returned in good condition, not later than thirty days after the opening of proposals. The deposit will be forfeited if the documents are not returned within thirty days.

THE PORT OF NEW YORK AUTHORITY
Donald V. Lowe, Chairman

New York, June 21, 1956

EMPLOYMENT OPPORTUNITIES

The Advertisements in this section include all employment opportunities—executive, management, technical, selling, office, skilled, manual, etc.

Positions Vacant
Positions Wanted
Part Time Work

Civil Service Opportunities
Selling Opportunities Wanted
Selling Opportunities Offered

Employment Agencies
Employment Services
Labor Bureaus

DISPLAYED ——RATES—— **UNDISPLAYED**

The advertising rate is $38.25 per inch for all advertising appearing on other than a contract basis. Contract rates quoted on request.

An advertising inch is measured ⅞" vertically on a column—3 columns—30 inches to a page.

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Send NEW ADS and Inquiries to Classified Advertising Division of ENGINEERING NEWS-RECORD, P. O. Box 12, N. Y. 36, N. Y.

REPLIES (Box No.): Address to office nearest you c/o this publication, Classified Adv. Div.
NEW YORK: P. O. Box 12 (36)
CHICAGO: 520 N. Michigan Ave. (11)
SAN FRANCISCO: 68 Post St. (4)

POSITIONS VACANT

Mechanical and Piping Erection Superintendent for sewage treatment and filtration plant construction. Midwestern contracting firm specializing in this work has permanent position open. Please give experience and full details in reply. Replies will be held confidential if requested. P-1719, Engineering News-Record.

Engineers experienced in design and supervision of construction to work as resident engineers or prepare plans for water and sewer systems; also, architects for preparation of plans for general building work. State experience, age, salary required, when can report, and give references. Reply P-1800, Engineering News-Record.

Designers & Draftsmen—Structural, electrical, piping air cond., & arch. industrial buildings and power plants. Marbarry, 120 Greenwich St., N.Y.C. RE-2-3749.

Superintendents, mechanical engineers and estimators needed by rapidly expanding mechanical contractor, specializing in industrial construction. Excellent opportunity for advancement in all fields. Submit resume of experience and availability with initial reply. P-1880, Engineering News-Record.

Graduate Engineer to become City Engineer in a community of 22,000 population, which is a suburb of the City of Detroit. Engineer will be in charge of the Department and have control of all public works within the city. Need not be registered. Salary open, but in neighborhood $6,500.00 and $7,000.00. Applications to the City Manager, City Hall, 3322 Coolidge Highway, Berkley, Michigan.

Instructor—To teach undergraduate courses in applied mechanics. Opportunity to work on graduate degree in any engineering department. Salary depends on qualifications of applicant. Department of Applied Mechanics, University of Kansas, Lawrence, Kansas.

Engineers on design of water and sewage treatment projects, in long established organization specializing in sanitary engineering and now interested in adding a few men to its permanent personnel. Location, Ohio. Experience in related fields considered applicable. State full information, experience, references. P-1868, Engineering News-Record.

Engineers one or two years experience in structural design or recent graduates. Consulting engineers office Newark, N. J. Give education, experience and salary. P-8890, Engineering News-Record.

Superintendent—with engineering background —to become associated with a growing excavating-paving and flood control contractor in Western New York. As field superintendent the right man can build his own future. Sheridan Construction Corp., 3580 Sheridan Drive, Buffalo 21, New York.

Estimator for Commercial, Institutional and Industrial Building Construction by long established and well rated Central Pennsylvania Construction Organization. Must be experienced and capable. Give full information —covering experience, education, age, salary, references and personal data in letter of application. P-1939, Eng. News-Record.

POSITIONS VACANT

Structural Engineer—Registered Civil Engineer for prestressed concrete plant under construction in Western Penna. Building and Bridge design experience required. Prestressed concrete design, construction and sales experience desirable but not necessary. Prefer applicant aged 30 to 40. In first letter submit complete resume of experience, education, references, salary requirements and date available. Only applicants interested in a permanent position in the prestressed concrete field and capable of growing with the industry need apply. Please include telephone number. Reply to P-2011, Engineering News-Record.

Assistant Professor and Instructor in Civil Engineering. Assistant Professor to take charge of surveying—highway course sequence and surveying camp. Eastern metropolitan college, start September 1, 1956. Reply P-2004, Engineering News-Record.

Municipal Engineer must be registered or able to obtain registration in Ohio; experience in Municipal work desirable. Recent graduates also needed as E.I.T.'S; salary is dependent upon experience and qualifications. Apply 500 Municipal Building, City Engineers, Dayton 2, Ohio.

Sales Engineer-Structural Engineer with proven sales background in masonry and primarily interested in sales. Must be willing to travel in East from Upstate New York office. National manufacturer of steel product used with masonry desires top-notch sales engineer to work with established outlets in sale and promotion of product from four plants located in East. Salary open. Furnish business and personal resume, salary requirements, availability first letter. P-1975, Engineering News-Record.

Assistant Chief Draftsman: Established Southern structural steel fabricating company desires to employ permanently a thoroughly qualified man to act as assistant to chief draftsman. Duties supervisory, including planning of drafting work. Must be able to obtain results and to be congenial with average draftsman group. Employment benefits such as insurance, paid vacation, pension plan, etc. Reply in full, giving complete experience, age, health, marital status, references who know your ability. Excellent opportunity for steady and reliable man with extensive experience. P-1977, Engineering News-Record.

College Teaching position open to teach civil engineering and mechanics courses other than structural. Rank and salary based on applicant's qualifications. Write: Head, Civil Engineering Department, Clarkson College of Technology, Potsdam, New York.

Wanted . . . Bridge Superintendent to take complete charge of bridge and foundation work for long established New England contracting firm operating in New York and New England. Salary commensurate with experience and ability. P-1980, Engineering News-Record.

Construction Mgr. for expanding gen. contractors office. Grad. CE. Minimum 10 yrs. experience. Labor following necessary. Send resume; state salary. P-1949, Engineering News-Record.

Materials Engineers in several grades wanted by Mid-West consultants. Must know construction materials testing and inspection, including field control soils, and concrete. Furnish resume, salary requirements, availability, first letter. P-1840, Engineering News-Record.

POSITIONS VACANT

Engineer Estimator with foreman and superintendents experience on large and small sewer jobs. This is a small company; current gross $650,000. Personnel is competent and no junk equipment. Large but competitive market. Midwest location. Key job to man with proven ability. Salary, share of total profits, and voice in company affairs. State full experience and salary expected in first letter. P-2099, Engineering News-Record.

Instructor, Assistant or Associate Professor in electrical engineering. Master's degree, teaching experience desirable, not essential. Salary (9 Months) $4200-6800. New York State. P-2080, Engineering News-Record.

Midwest Consultant wants senior materials engineer with broad experience. $8,000-$10,000 bracket, depending on background. Reply in full to P-2076, Engineering News-Record.

Graduate Civil Engineer. Good future for energetic individual. Vacation and Welfare insurance. Salary $5,000. Location Central Illinois. No experience required. P-2057, Engineering News-Record.

Assistant Manager for Concrete Products Company to train for manager. Age 28-38. Engineering background or construction experience. Beginning salary $5,000—profit sharing. Location: Southern Illinois. Send complete resume with first letter to: Peyton's Concrete Products Co., Benton, Illinois.

Civil Engineer with executive ability. Will get experience in all phases of engineering. Age 30-40. Opportunity for capable and ambitious man. Salary open. Write: P-2060, Engineering News-Record.

Mechanical and Piping Detailer for sewage treatment and filtration plant construction. Midwestern contracting firm specializing in this work has permanent position open. Please give experience and full details in reply. Replies will be held confidential if requested. P-1715, Engineering News-Record.

POSITIONS WANTED

Construction Engineering Ohio license 30 years experience. Prefer sewage or water plants available at once. PW-2020, Engineering News-Record.

Executive Engineer—Designer—Draftsman— Arrangements intimately acquainted with several trades. Lic. Eng'r. in State of New York. Originally qualified as journeyman in 5 trades. Very cost conscious and reliable. Prefer Grand Central area. PW-1956, Engineering News-Record.

Structural Engineer, licensed graduate, 30 years diversified design, and construction experience in subways, waterfronts, chemical plants, power plants, etc., available for responsible position. PW-1930, Engineering News-Record.

Highway Engineer—Reg. P.E.—25 yrs. appropriate experience—seeks high level job in consultant's Highway branch. Reply PW-1960 Engineering News-Record.

(Continued on page 126)

WHEN *Answering Advertisements*

PLEASE *do not send original letters, certificates or photographs. We cannot be responsible for their return. Please send photostat or carbon copies.*

Design Engineers
Design Draftsmen

If you want
- HIGHEST EARNINGS
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- IDEAL WORKING CONDITIONS
- AIR-CONDITIONED OFFICES
- MANY OTHER BENEFITS

Please be sure to contact or see

Arthur G. McKee & Co.

with Engineering Offices in
CLEVELAND, OHIO and UNION, N. J.

McKee is a 50-year-old Engineering and Construction firm doing business on a world-wide basis.

Interesting, well-paying positions for

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TOwer 1-2300

ESTIMATORS

BUILDING
ELECTRICAL

Immediate permanent positions are available in our Cleveland, Ohio office for applicants who have an engineering degree or equivalent in design and/or field experience. In addition must have take-off and pricing experience on all types of industrial and commercial buildings, and/or electrical installations.

These positions offer an opportunity to become associated with one of the country's foremost industrial engineering and construction companies. In addition to a good starting salary we offer excellent working conditions with paid vacations, sick leave accrual plan, company-sponsored insurance plan and overtime based on current 48 hour work week.

All replies will be treated confidential and arrangements will be made to interview selected applicants. Please submit complete resume stating experience, education, salary required and date available to:

P-1877, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

BECHTEL

ENGINEERS
DESIGNERS

MECHANICAL—
Design experience in one or more of the following fields:

Refinery and Chemical Plant Processes, Steam Power Plants, Hydro-Electric Projects, Instrumentation and Controls, Materials Handling Equipment, Metallurgical Process Equipment such as metallurgical furnaces, kilns, crushers, or related heavy machinery, heating and ventilating, or industrial plant layout.

ELECTRICAL—
Responsible design experience on panel boards, industrial controls, power distribution or lighting.

STRUCTURAL—
Design or detailing experience in structural steel and/or re-inforced concrete for Petroleum Refineries, Steam Power, Hydro Electric, or industrial projects.

PIPING—
Designers with drafting and layout on high temperature high pressure piping.

Immediate openings in our

SAN FRANCISCO
and
LOS ANGELES OFFICES

LIBERAL RELOCATION ALLOWANCES

Send Resume:
5 West 45th St. New York 17, N. Y.
220 Bush St., San Francisco, Calif.

Confidential interview can also be obtained at: Scanlon Building, Houston, Texas, or Roosevelt Building, Los Angeles, Calif.

BECHTEL
CORPORATION
Engineers - Constructors

SALES ENGINEER

Packaging equipment, nationally known manufacturer. Able to survey and recommend equipment needs, various products. Engineering grad. industrial or mechanical preferred. Experience in cement, feed, allied industries desirable. Will consider substitution experience for education; company car furnished; salary commensurate with qualifications.

Send full resume to

ST. REGIS PAPER CO.
18 S. Michigan Ave., Chicago 3, Illinois.

ENGINEERS

Long established firm of consulting engineers with world-wide practice needs both beginners and experienced civil, electrical, mechanical, and foundation engineers for interesting work on large dams, powerplants, river control works and highways. Permanent positions. Liberal employe benefits. Starting salaries dependent on qualifications. Please send complete resume to Hugo Niemi, Personnel Manager.

HARZA ENGINEERING COMPANY
400 W. Madison St.
Chicago 6, Ill.

AUTOMOTIVE ENGINEER
Foreign Employment

Recent graduate with limited or no experience. For company's training program in Saudi Arabia.

Salary commensurate with education and experience. Write outlining personal history and work experience.

Recruiting Supervisor, Box 137

ARABIAN AMERICAN OIL COMPANY
505 PARK AVENUE, NEW YORK 22, N. Y.

HIGHWAY ENGINEERS
for work in
New Jersey and New York

Designers, draftsmen, chiefs of party, specification writers — submit complete resume stating education, experience, salary desired and date of availability to

P-1603 Engineering News-Record
330 W. 42 St. New York 36, N. Y.

ENGINEERS—DESIGNERS—DETAILERS
for work on
BRIDGES AND HIGHWAYS

Permanent Positions for Experienced Men and New Graduates in our CINCINNATI, OHIO, and LANSING, MICHIGAN, Offices.

Paid vacations and holidays, insurance and retirement plan.

Please give detailed personal and experience record, references and salary expected in application letter.

Hazelet & Erdal, Consulting Engineers
Dixie Terminal Bldg.
Cincinnati 2, Ohio

Engineers Architects

Highway—Bridge
Designers—Draftsmen
Soils Engineer
Irrigation Designer
Consulting Engineer (Irrigation)
Architectural Designers—Draftsmen
Ink Tracers—Computors
Civil Engineering Draftsmen

Air Mail Resume TO R. L. SHAW, *Personnel Director*

MICHAEL BAKER, Jr., Inc.

BAKER BLDG. *Consulting Engineers* ROCHESTER, PA.

SANITARY
HIGHWAY
ARCHITECTURAL

DESIGNERS and DRAFTSMEN

Regular Staff Position
Depending on Experience and Ability

CHAS. W. COLE & SON
220 W. LaSalle Ave., South Bend, Indiana

STRUCTURAL
ENGINEERS
DESIGNERS
DRAFTSMEN

Prefer several years' experience in bridges, buildings, highway structures or hydro structures. Will consider lesser experience with good educational background.

We are professional engineers and desire men who wish long range employment with good opportunity to advance and develop in professional engineering. Occasional openings in construction supervision and inspection.

Paid vacation, sick leave, holidays, overtime. Employee Benefits Plan furnishes retirement income and insurance. Blue Cross. Moving allowance. Openings available in St. Louis and San Francisco.

Please write fully to

SVERDRUP & PARCEL, INC.
Engineers - Architects
915 Olive St. Louis 1, Mo.

INDUSTRIAL ENGINEERS

College graduates with minimum 6 years' work experience in industrial engineering, cost analysis or related activities. To provide industrial engineering services ranging in scope from shop layout to organizational changes in major oil producing operations.

Write, giving full particulars regarding personal history and work experience. Please include your telephone number.

Recruiting Supervisor, Box 93

ARABIAN AMERICAN OIL COMPANY
505 PARK AVENUE
NEW YORK 22, N. Y.

Civil Engineers

Expanding general construction firm wants civil engineers under 35 years of age with building construction experience to undertake training for permanent positions as estimators. Firm operates throughout New York State. Please give full resume, strictly confidential.

John W. Rouse Construction Corp.
8 Church St., Gouverneur, New York

SUPERINTENDENT WANTED

For gravel plant involving dredging and barging materials. Also stone quarry operations. State full experience, age, list references, and salary expected.

FRED R. McKENZIE & CO.
Room 405, Bondi Building, Galesburg, Ill.

ASSISTANT CHIEF DESIGN ENGINEER on Bridges and Highways—exceptional opportunity for thoroughly experienced engineer to grow with expanding, long established engineering firm. Very attractive compensation arrangement. Air-conditioned offices in midtown New York.

LEONARD S. WEGMAN CO.
Grand Central Terminal New York 17, N. Y.
Murryhill 6-5630

Wanted—CIVIL ENGINEERS

Experienced in Municipal Engineering: Principal Civil Engineer, Senior Engineer, 3 Civil Engineers. Liberal benefits including annual wage increase, Longevity, Paid Vacation, Sick Leave, Retirement Plan with Social Security, Group Life Insurance, Sick and Hospital benefits.

Contact Superintendent of Public Works
Ann Arbor, Michigan

DESIGN ENGINEERS DRAFTSMEN

Excellent opportunity for permanent positions with a top firm which is rapidly expanding in the progressive pulp and paper industry. Location in mountain area of western Virginia.

DESIGN ENGINEERS—M.E., C.E., or equivalent education with three or more years experience, not necessarily paper mill, for piping, structural, plant layout, and design.

DRAFTSMEN—College degree not required but must have at least three years experience, not necessarily paper mill.

Complete resume including education, experience, present salary, and late photograph if available should be sent to:

HAROLD E. MILLER
Technical Director
West Virginia Pulp & Paper Company
Covington, Virginia

NEW BUSINESS MAN
for well known firm in
INDUSTRIAL ENGINEERING

must be experienced and have successful record in developing new business involving methods studies, materials handling systems, plant layouts, structural design and supervision.

Replies will be treated in strict confidence.

P-2058 Engineering News-Record
330 W. 42 St, New York 36, N. Y.

POSITION AVAILABLE

Graduate Structural Engineer with experience in railroad B&B department for educational work with railroads. Age 30 to 40 years. Headquarters Chicago. Travelling about one half the time. Opportunity for advancement. Salary Open.

P-2008, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

CIVIL AND SANITARY ENGINEERS

Civil Engineer for complete supervision of sanitary sewer and water supply for rapidly developing area. Excellent opportunity and salary. Also two experienced sanitary engineers to work with above as assistants. Please state full qualifications, experience, references.

P-2025, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

ENGINEERS
Structural, Highway & Railroad

Salary commensurate with qualifications. Submit resume to

DE LEUW, CATHER & BRILL
202 East 44th Street New York 17, N. Y.

Equipment Maintenance Superintendent

For 400 truck, 70 crawler unit fleet. Outstanding opportunity with one of the largest, most progressive companies in the midwest. Send resume of education, experience, and salaries earned. Also name of contact at your local bank.

P-2101 Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

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BOX NUMBERS...

to expedite the handling of your correspondence and avoid confusion, please do not address a single reply to more than one individual box number. Be sure to address separate replies for each advertisement.

STRUCTURAL and MECHANICAL DESIGNERS

Having experience with heavy material handling equipment

Permanent Position For Qualified Men

HOSPITALIZATION
INSURANCE
VACATION

Phone or Write
Chief Engineer for interview

THE WELLMAN ENGINEERING CO.

7000 CENTRAL AVE.
Cleveland 4, Ohio
Telephone EN 1-0842

HIGHWAY ENGINEERS
DESIGNERS
DRAFTSMEN
Drainage Engineers

FOR OFFICE WORK IN ST. LOUIS ON HIGHWAYS EXPRESSWAYS AND ASSOCIATED CIVIL WORKS

- *Permanent employment for qualified men*
- *Ample opportunity for advancement based on merit*
- *Generous transportation & moving allowances*

Plus: Employee Benefit and Retirement Plan, Paid Vacations, Holidays, Sick Leave. Blue Cross available.

PLEASE WRITE FULLY TO OR INQUIRE AT

SVERDRUP & PARCEL ENGINEERING CO.

1134 LOCUST ST. ST. LOUIS 1, MO.

CONSTRUCTION MANAGER

Experienced Engineer and Constructor With Executive Ability

Approx. 15 yrs experience all phases construction and installation equipment for eight Steam Electric Stations plus Transmission Lines. Part of extensive development program for large long established group of Electric Utilities. Location Latin America. Headquarters large city. Applicant must have proven administrative ability and be cost and system conscious. Reply stating age, education, experience and personal particulars.

AMERICAN & FOREIGN POWER CO. INC. and SUBSIDIARIES

2 Rector Street, New York 6, New York
21st Floor DI 4-4400 Ext 8494

CIVIL & SANITARY ENGINEERS & DRAFTSMEN

Two graduate, licensed Civil Engineers with at least 10 years experience in design and preparation of plans and specifications for Sanitary Public Works Engineering projects, including water and sewage treatment plants and distribution systems.

Two engineering draftsmen experienced in preparation of plans for Sanitary Engineering projects.

P-1842, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

ENGINEERS DESIGNERS DRAFTSMEN

in the following fields:

STRUCTURAL
CIVIL
MECHANICAL
PIPING
ELECTRICAL LAYOUT
COST ESTIMATING

Generous Company Benefits

Long Range Program on Heavy Industrial Plants

Send resume or Apply Personally

WESTERN KNAPP ENGINEERING CO.

760 Folsom St.,
San Francisco 7, Calif.

OPPORTUNITY

ESTIMATOR—ASSESSMENT EVALUATOR

To make construction cost estimates of standard and specialized commercial and industrial structures and evaluate appraisals and/or assessments on such properties for taxation purposes. Knowledge of structural components and costs essential. Must have understanding of detailed construction plans, specifications, and architectural drawings. Liberal sick leave, vacation, 40 hour work week, 12 paid holidays per year, group insurance at reduced rates, modern pension system, merit system promotions.

Salary range $6600 to $8100.

Send or bring history of education and experience, as well as references to:

Department of the Treasury,
State of New Jersey Administrative Division
State House, Trenton 25, New Jersey

ENGINEERS FOREIGN SERVICE

Graduate Chemical, Mechanical and Electrical Engineers with minimum 5 years' experience. For specialized assignments commensurate with qualifications in plant maintenance, inspection, technical services, process studies and related work. Write giving full particulars regarding personal history and work experience. Please include your telephone number.

Recruiting Supervisor, Box 95

ARABIAN AMERICAN OIL COMPANY

505 PARK AVENUE, NEW YORK 22, N. Y.

GENERAL MANAGER and ESTIMATOR

For Sewer and Water Line, Treatment Plant Construction; South Florida experience essential. Aggressive with proven qualifications. Able to coordinate inside and outside. Good salary and bonus opportunity.

MARBAUGH CONSTRUCTION CO.
211 N.W. Fifth St. Ft. Lauderdale, Fla.
JAckson 2-8553 Res. JA 3-9817

MECHANICAL ENGINEER

Experienced in design and development of construction equipment. Must have administrative and executive ability. One step from General Manager for capable man by young ambitious and successful Cincinnati Manufacturer. Salary open. Unusually rare opportunity for the right man. Complete resume with first letter.

BUCK EQUIPMENT CORPORATION
720 Anderson Ferry Road, Cincinnati 38, Ohio

Specification Writer, Estimator, Sanitary Engineers and Draftsmen

To work with long-established sanitary engineering consulting firm in New York City. Life insurance and other benefits. Salaries open.

BOGERT and CHILDS
145 East 32nd Street New York 16, N. Y.

POSITIONS WANTED

(Continued from page 122)

Construction Executive 28 years experience in all phases of heavy and industrial construction, power plants, chemical plants, refinery installations, buildings, locks, dams and tunnels, interested in connection with aggressive contractor in west or northwest doing lump sum contracts and promotional sales work. Estimating and pricing accurate, and construction methods current. Primary education M.E. Desirous of participating arrangement. PW-1992, Engineering News-Record.

Paving-Civil Engineer, 31, Reg. (N.Y.) experienced roads and airfields as project, resident and design engineer. Desire position with heavy construction contractor, East. Broad opportunity. Present salary over $9,000. PW-1981, Engineering News-Record.

Civil Engineer. Twenty years experience. Highway design and municipal works. Resident and design engineer. Prefer Baltimore-Washington area. PW-2022, Engineering News-Record.

Electrical Engineer: Fifty-four years old, married, no children, health perfect, free to travel. Over thirty years experience many phases electrical business, design, estimating, supervision. Prefer work with contractors or builders, no electronics or 100% board work. Lettering fair. Can design for draftsman to do final lettering. PW-2021, Engineering News-Record.

Construction Executive, buildings and heavy construction, sound experience bid to completion, qualified to manage a project, branch office or a business, seeks new connection where top man is required. Minimum $15,000. PW-8792, Engineering News-Record.

Construction Supt. or Assit. available immediately. PW-2013, Engineering News Record.

Soil Engineer, Scandinavian, grad. Harvard, age 35, 12 years exp. in research & consulting work in soil mech. Gumaelius Advertising, Stockholm, Sweden.

Danish Civil Engineer, M.S. age 28, seeks pos. in U.S.A. 5½ years experience. Specialist in design of prestressed concrete. Fluent english from 1½ years practice in London. Civilingenior Ove Eriksson, Lundtofteparken 26, Kongens Lyngby, Denmark.

Construction Engineer-34, C.E. graduate, 8 years field & office experience on power plants & bridges for contractor & owner. Desire permanent position West Coast area. PW-2085, Engineering News-Record.

General Superintendent. Engineering background, steadily employed 18 years, earth moving, industrial buildings, concrete, salary, $10,000, PW-2078, Engineering News-Record.

Engineer. 20 years responsible experience in design of hydraulic structures, dams, foundations, tunnels, buildings. Also engineering administration. Registered. PW-2051, neering News-Record.

Estimator, 27, BSCE—experience field work 2 yr., estimating paving, sewers, water, gas, electric, telephone over 3 yr. Structural major. Presently $600/mo. Go anywhere w/family. PW-2055, Engineering News-Record.

Sanitary Engineer, 27, USAF Lt., BCE, MSCE, 4 yrs. experience, desires position with consultant or industry in Sept. SF-Oakland, NYC areas. PW-2102, Engineering News-Record.

Construction Engineer, 31 BSME 4 yrs. experience. Field Engr. and assist. supt. on industrial and institutional bldgs. Relocate to West Coast or overseas with wife (teacher & secretary.). PW-2108, Engineering News-Record.

Chief estimator age 38 engineer fully experienced government industrial, commercial and private work. Handle complete bid, buying, management. Currently employed, seeks new connection. Will relocate minimum $10,000 plus bonus arrangement. PW-2106, Engineering News-Record.

WORK WANTED

Drafting subcontracts wanted. Work performed under direction and supervision of professional engineers Box 1127 Church St. N.Y. 8.

Structural Engineer expert on Electrical switching stations, power stations and all outdoor structures. Available on consulting basis. WW-1890, Engineering News-Record.

SEARCHLIGHT SECTION

(Classified Advertising)

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Send NEW ADVERTISEMENTS or Inquiries to Classified Advertising Div. of Engineering News-Record, P. O. Box 12, N. Y. 36, N. Y.

FOR SALE

JOHNSON BATCH PLANT

Two 2 Yd. Mixers,
400 bbl. Cement
Capacity Complete,
Modern, First Class
Condition.

AGGREGATE CONVEYOR

Unloads from cars,
stockpiles,
charges mixers—
Complete,
First Class Condition.

CONCRETE BUCKETS,

1, 2, & 4 Yd. Capacity.
Good Condition.

RIGS, COMPRESSORS, OTHER EQUIPMENT

Details and prices
on request.

WRITE, WIRE, PHONE

J. R. Bargas

KAISER-PERINI-WALSH

P. O. Box 645
Riverdale, No. Dak.
Tel. 653

SPECIAL SERVICES

Professional Engineers offer services on design & detailing of industrial plants, bridges, highways and all types of buildings. Hourly or contract basis. 88-2110, Engineering News-Record.

Engineers—Foremen—Office Men

Learn latest methods to organize and run work. Prepare for the top jobs.

Send post card for details.

GEO. E. DEATHERAGE & SON
CONSTRUCTION CONSULTANTS
P.O. Box 921 — Lake Worth, Florida

Wanted To Buy or Rent

Several complete sets of foundation hole or caisson drilling augers with a complete range of sizes from 12" to the largest size made and including the corresponding under-reaming or belling tools. Write giving available sizes, price and picture if possible.

Inter-American Machinery Company
100 Broadway — Houston 12, Texas

USED CREOSOTED TIMBERS 7" x 9"

Ideal for constructing retaining walls, bulkheads, parking bumpers and can be used as railroad ties.

R. WOESNER
450 Chestnut Lane East Meadow, L. I., N. Y.
Phone: Ivanhoe 9-2102

STRUCTURAL ENGINEERING
ARCHITECTURAL ENGINEERING
OUR COURSES of instruction by mail HAVE HELPED THOUSANDS to better positions and to pass State Board Examinations. Forty-third year
Inquiries without obligation
WILSON *Engineering Corp*
College House Offices HARVARD SQ., CAMBRIDGE, MASS.

SURVEYING INSTRUMENTS
USED • REBUILT • SALE
RENT • REPAIRING

GURLEY

REPAIR SERVICE

Send your instrument to the factory for repair, rebuilding, adjustment. Write today for "Repair Service" leaflet.

W. & L. E. Gurley, Dept. R, Troy, N. Y.

FOR SALE or RENT

1—Full Revolving Electric Gantry Crane, 440-60-3

1—Full Revolving Steam Gantry Crane, 40 tons capacity

1—Full Revolving Steam Crane 60 tons capacity, for barge or gantry mounting

1—855-A P&H Diesel Crane, with Fairlead, only 400 hrs.

2—250' Car Floats or Barges

1—lot of Blaw-Knox Steel Forms like new, suitable for dams or walls

1—Steel Stiff Leg Derrick, 25 tons capacity, 80' boom. Complete with electric hoist.

4—100 ton—5-sheave Derrick or Crane Blocks with Shackle, and with Cheek Weights, reasonable.

4—50 ton—4-sheave Blocks with Shackle, with or without weights.

2—Steel Barges 210' x 55' x 10'.

20—Pontoon Float Bridges 5' x 5' x 7'

WILLIAM P. SWIFT

P. O. Box 174 Springfield, Pennsylvania
Swarthmore 6-8999

HEAVY EQUIPMENT

FOR SALE OR RENTAL PURCHASE

HD-15 & HD-20 TRACTORS—NEW YORK STATE
4—9K NO. 12 MOTOR GRADERS
EUCLID LOADERS & BOTTOM DUMPS, 13 & 17 CU. YD.
15 & 22 TON END DUMPS
CATERPILLAR D-13000, W364, ENGINES
FERGUSON 100 TON ROLLER, CEDAR RAPIDS COMPACTOR
BUCKETS: DRAGLINE, CLAMSHELL & CONCRETE ⅜ TO 4½ CU. YD.
2—CAT D-8's WITH GARDNER-DENVER 600 COMPRESSORS & D99DT DRILLS
CONCRETE PAVERS, FINISHERS, SPREADERS & VIBRATORS
CESSNA 310 LOCKHEED LODESTAR AIRPLANES
50 HP BOILERS; MAGNETIC PULLEY, ROAD MAGNET
MAYHEW 1000 DRILL RIGS, TRUCK MOUNTED

For full information Call or write

VALLEY VIEW EQUIPMENT CO.

ROUTE 7, BOX 497-E DALLAS, TEXAS ADams 5-7134
Nights & Sundays: BILL BREWER — DAvis 7-5719

2—Super "C" Tournapulls with Cummins engines. Gear driven. Working condition. $5,000 ea. f.o.b.—Indianapolis.

1—Northwest Crane Model #5 S/N 4316 with Cummins Diesel engine. 10 ft tracks 24" pads. 1½ yd. shovel front w/40' dragline boom. Condition—fair. Price $6,000, f.o.b. Logansport, Ind.

INDIANA EQUIPMENT COMPANY, INC.

1244 W 16th St. Indianapolis, Ind.
MElrose 2-8371.

Quitting Grading Operations

ALLIS-CHALMERS

6, TS-300 MOTOR SCOOPERS
2, HD-20 TRACTORS
1, HD-9 TRACTOR

Phone, Wire or Write

Henry Doelger Builder, Inc.

333 PARK PLAZA DRIVE
DALY CITY, CALIFORNIA
PLaza 5-1313

IMMEDIATE DELIVERY

equipped steel erection purposes

1—Manitowoc Model 2000 60 Ft. Quick Change Boom Independent Boom Hoist. 15 Ft. Jib

1—Northwest 100 Ft. Boom—25' Jib.—Serial 10910

1—T20 Brownings—100 Ft. Booms—35 Ft. Jibs—Serial No. 3960

DONALD B. MAC NEAL

12100 S. Loomis St. Chicago 43, Ill.
Pullman 5-4411

FOR SALE

Lima Model 802 Crane-Dragline

Model D-17000 Caterpillar Engine. Oversize cats, full accessories.

George A. Bass Construction Co.
Birmingham, Michigan

FOR SALE

Parsons Trenchliner 310, 250 & 221; Buckeye C-15, 160, 407, 410 & 120; Cleveland 92, 85, 110 & 140 & Model 170 lateral type. Barber Greene Roustabouts. Int. T-9 Swing Cranes. TD 14 Side Boom.

AIR COMPRESSOR RENTAL CO.
19815 Nottingham Road Cleveland 10, Ohio

EUCLID
TWIN POWER SCRAPERS

3—Model 10 TDT-218H With Fully Enclosed Cabs, Lights, Heaters And Defrosters

EXCELLENT CONDITION

Hours Operated - 450 - 4000 - 4300

STANDARD EQUIPMENT CO.
340 PIERCE ST., KINGSTON, PA.
Phone BUtler 8-1426

FOR SALE

1 Lorain 80, Shovel Front Complete, Excellent Condition, Reasonable Price.
1 Northwest Model 6, Shovel Front Complete, Excellent Condition, Reasonable price.

De GEORGE CO., Inc. *Pelham 8-2462*
603 Fifth Ave. Pelham 65, N. Y.

Rent—GENERATOR SETS—Sale

1—15 KW Kohler 3/60/120/208 Gasoline
1—35 KW Onan 3/60/120/208 Gasoline
1—20 KW Intern'l Harvester 3/60/120/208 Diesel
2—25 KW Intern'l Harvester 1/60/120/240 Diesel
1—60 KW General Motors 3/60/127/220 Diesel

DIESEL MOTORS COMPANY
46 S. Bayles Ave., Port Washington, L. I., N. Y.
POrt Washington 7-2000

FOR SALE

110 H.P. Johnston Locomotive Type
PORTABLE STEAM BOILER
OIL FIRED, ASME CODE NEW 1950 PRICE $5500 FOB DETROIT, MICHIGAN

JUTTON-KELLY COMPANY
13240 Alber Avenue, Dearborn, Michigan

FOR SALE or RENT—EASY TERMS

Rebuilt—A 1 Condition
498 Bucyrus Erie Shovel 2 cy Diesel
Northwest Model Shovel, 1½ cy
Comb. Caterpillar D8 & 80 Scraper
10 ton Buffalo Springfield Gas Roller
International Vibro-Tamper

WILLIAMS CONSTRUCTION COMPANY
Box 145 Balto. 20, Md. Murdock 6-6600

FOR SALE or RENT

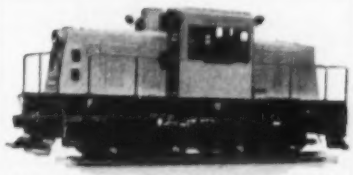
1—25 Ton Bay City Truck Crane, 95' Boom, New 1952.

B. M. WEISS CO.
Girard Trust Bldg. Philadelphia 2, Pa.

RAILS-TIES

TRACK ACCESSORIES

NEW and RELAYING



50 T. PORTER DIESEL ELECTRIC LOCOMOTIVE, new '41, ser. #7300 cl; 150 HP Cummins Engines (total 300 HP) used 1 yr; excellent condition $19,750
DIESEL ELECTRIC LOCOMOTIVES, & locomotive cranes, 25-45-50-65-80-105 tons.
Tel. EDison 4-9471-2
EVEREADY: PO Box 638; BRIDGEPORT, CONN.

FOR SALE

In Excellent Condition

3—1953 HEILINER MOTOR SCRAPERS

Model #2C-800-Cummins Engines NHBI
All practically brand new tires
2400x29 24 ply—18 yd. Bodies
May be inspected at our Palmer Project—Mass. Turnpike

GRANDVIEW CONSTRUCTION CORP.
P. O. Box #505, *Tel. Palmer 1511*
Palmer, Mass.

RAILS
NEW — RELAYING — TRACK ACCESSORIES
MIDWEST STEEL CORP.
502 HAYDEN AVENUE
CHARLESTON, W. VA.
IMMEDIATE DELIVERY

FOR SALE
WIDE FLANGE BEAMS

8" WF @ 31#	12" WF @ 27#	14" WF @ 38#	18" WF @ 105#
8" WF @ 35#	12" WF @ 31#	14" WF @ 43#	18" WF @ 114#
10" WF @ 21#	12" WF @ 36#	14" WF @ 48#	21" WF @ 62#
10" WF @ 25#	12" WF @ 40#	14" WF @ 53#	24" WF @ 76#
10" WF @ 29#	12" WF @ 45#	16" WF @ 58#	24" WF @ 84#
10" WF @ 33#	12" WF @ 50#	16" WF @ 78#	24" WF @ 94#
10" WF @ 39#	14" WF @ 30#	18" WF @ 50#	27" WF @ 94#
10" WF @ 45#	14" WF @ 34#	18" WF @ 70#	30" WF @ 124#
			33" WF @ 152#

ALAN STEEL COMPANY, INC.
1241 Searles Road, Toledo 7, Ohio — Phone: FRanklin 1611

FOR SALE

6' x 22" Hardinge Conical Ball mill
Rotary Steam Tube Dryer—4' x 20'
Rotary Hot Air Dryer—3' x 24', 4'6" x 40', 5'6" x 50', 4'6" x 32'.
8" x 10" Sturtevant Jaw Crusher
Hoists, Cranes, Conveyors

We pay for your surplus; send us your listings

PERRY EQUIPMENT CORP.
1410 N. 6th St. ST 4-7210
Phila. 22, Pa.

MANITOWOC 2000B CRANE

60' Boom, 30' Jib, Equipped

For Hook, Clamshell, Dragline Work
Cummins Diesel Engine
Good Condition

Location—Working Bridgeport, Conn.
Price $15,000

Cayuga Foundation Corporation
30 Vesey Street
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Why Public Atomic Power?

ARGUMENTS BEING USED TO PROMOTE A BILL for federal construction of six nuclear power plants, would suggest that some emergency existed, comparable to our need for H-bombs or inter-continental weapons. That just is not the case. Our power needs for a good many years can be supplied more cheaply from other sources than from atomic power. That may not be the case in some other parts of the world.

Actually, in so far as our world position is concerned, the only element of emergency in our atomic power program is to be sure that we have reactors which we can supply to countries that need them, and thus be able to meet any competition that may develop from abroad. In the final analysis these reactors must be built and sold by American industry. Obviously it could get its know-how from experimental reactors developed either by the federal government or by private utility companies. But for the long-time good of American power advancement it is much more essential that the private utilities familiarize themselves with nuclear power than that the federal government do so.

The current argument is pretty pointless unless one is a public power advocate, and is working for the time when the great bulk of our power will come from nuclear plants, with the hope that all such plants will then be operated by the federal government. That, however, is just a public power argument and not one that concerns a national emergency.

Chairman Strauss of the AEC accurately stated the American position when he said, "Our present goal is more scientific knowledge, not simply more kilowatts." This goal can be achieved more readily, and with more practical benefit to our future power supply, if the federal government works in partnership with private industry and the private utilities than if it embarks alone on a program of public atomic power.

And further on public vs private power . . .

Would Niagara Really Suffer?

COMMENDABLE ACTION BY A PRIVATE UTILITY in Connecticut tends to deflate one argument of public power proponents in neighboring New York. Those who insist that hydroelectric potential at Niagara be developed by the Power Authority of the State of New York have stressed the need for improving and making more accessible Niagara's great beauty; they have stressed it to the extent of classifying this—at least by implication—as a multipurpose project. Describing parks and parkways as hinged to the planned tunnel diversion and downstream powerhouse, they have concluded that this must be a publicly constructed project if all the public interests at Niagara are to be protected.

Now, in Connecticut, Shepaug Dam on the Housatonic River has been dedicated as the state's largest hydroelectric facility. It has been dedicated—not to the stockholders of the owner, the Connecticut Light and Power Co.—but to the service of the people of the state by a governor who praises the utility as a great ally in development of the state. The utility company president, for his part, announced that lakefront on the newly formed 14-mi reservoir will be made available for state park and community campsites at 10% of its current value.

The power companies who are ready and anxious to develop the wasting power potential at Niagara could certainly not be expected to include parks and parkways as part of their project. (In fact, it is questionable that the Power Authority of the State of New York should be expected to build such facilities, or even to plan them.) But neither should the private companies be expected to produce power to the detriment of the Niagara Frontier as a recreation spot of potentially enhanced beauty. The situation is certainly affected by the rockslide that demolished Niagara Mohawk's Schoellkopf station (ENR June 14, p. 27), but the recent action in Connecticut belies any necessity of complete state development at Niagara.

Ripe Pickings for Plastics

LIKE A SMALL BOY EYEING A JUICY APPLE, plastics manufacturers are hungrily eyeing the construction market. But this is an apple that cannot be devoured until it is ripe. Whether the construction industry has ripened enough remains to be seen.

Designers need time to familiarize themselves with the characteristics of these strange new materials and to learn to use them properly. Builders require time to learn how to handle and install them. Building officials, concerned with the health and safety of their communities, want to be sure that the use of plastics will not be hazardous.

During the past year, plastics have been trickling out of the laboratory and onto the job—into foundations, walls, floors, roofs, highway construction, piping (ENR June 7, p. 23). These pioneer applications indicate the potential of plastics in construction; but engineers will not consider mere installation proof of suitability. They must have sufficient time to observe the performance of these materials in the field and to learn how to iron out any wrinkles they perceive. And manufacturers of plastics need time, too, to develop new materials with all the present desirable characteristics and without some of the drawbacks.

The construction industry stands to gain a great deal by the introduction of new materials. So it will welcome a big bite when it is ready.

a One Man Show

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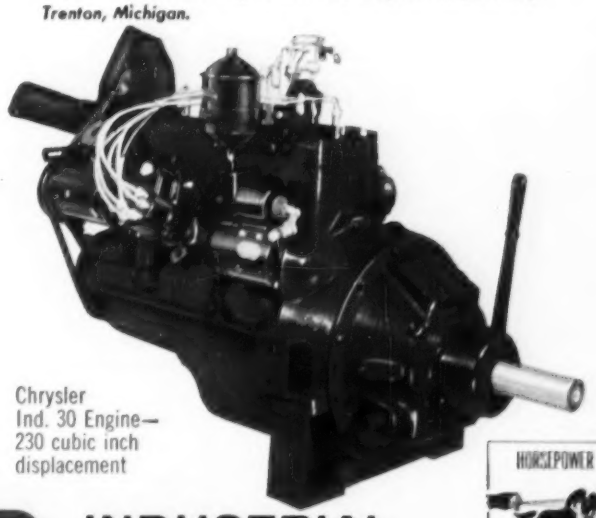

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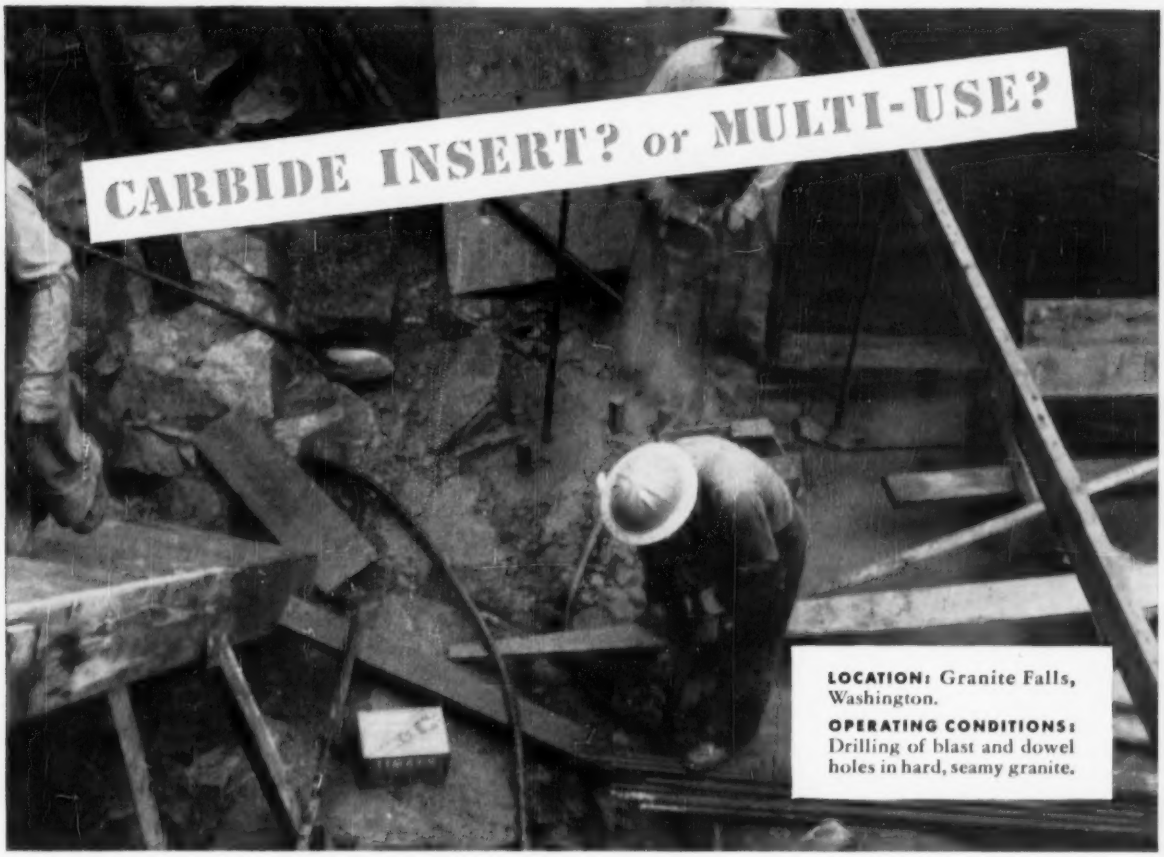
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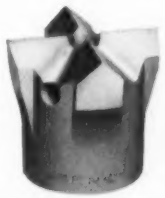

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